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Women's Role in Natural Resource Management in Africa

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WOMEN'S ROLE IN NATURAL RESOURCE MANAGEMENT IN AFRICA

Edited by

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INTRODUCTION

The papers presented in this volume grew out of a meeting held at York University in Toronto, Canada May 16-19, 1988. Sponsored by the International Development Research Centre (IDRC) and hosted by the African Studies Programme at York, the meeting brought together a small group of African and Canadian researchers who shared an interest in and concern for women's role in natural resource management.

The point of departure for the meeting was that women's knowledge about natural resources systematically has been overlooked by researchers and policymakers dealing with environmental issues in Africa. It was intended that during three days of discussions, participants would attempt to break new ground in the formulation of questions about women in development. Specifically, the meeting aimed to overcome the limitations of a sectoral approach, by tackling both concrete and theoretical questions about women and natural resources in the context of a synthesizing conceptual framework. The meeting was organized around three themes: i) Natural resources as perceived by individuals and groups; ii) the relationship between individuals and the natural environment; and iii) the relationships between communities and the environment. Each of the three themes was conceptualized around several critical observations.

i) Natural resources as perceived by individuals and groups. It is recognized that different cultures (and individuals within cultures), conceive of the environment from varying perspectives. Natural resource management in Africa in the 1980s is beginning to be considered a "problem." However, how that "problem" is defined has itself created problems for women. An example of such a conceptual problem is the failure to recognize that deforestation has created a double crisis for women. While there is awareness of the energy problem - a shortage of cooking fuel - the livestock feed problem has been invisible. As a consequence, reforestation schemes focussed on trees such as eucalyptus often cause new difficulties because they do not provide women with necessary animal fodder. Similar observations can be made about other sectors. For example, irrigation projects may be against the interest of women farmers because they divert local water supplies to cash crop production, making it difficult for women to find sufficient water for small scale food production.

ii) The relationship between individuals and the natural environment. This theme focussed on the relationship between specific resource issues and property and use rights, changing economic practices and relations, and the impact of state and aid policies on women. Discussion centred around the overt and the hidden environmental crises and their impact on women. The overt crises are those such as desertification and deforestation which already make a dramatic claim on public attention. The hidden crises are those which receive little notice because they are occurring in areas in which there is not yet an obvious and serious environmental problem. These include the impact of biotechnology, the use of pesticides, plant breeding practices, etc. The meeting focussed on women as actors rather than as passive recipients of change and attention was given to the transformation of women's decision-making styles in the context of both social and environmental change. Specifically, attention was drawn to the link between women's strategies and women's rights in resources, past and present as well as to the identification of inappropriate decision-making models that Western knowledge and policy have imposed in Africa.

iii) The relationship between communities and environment. This theme focussed on two important aspects of the relationship between women's groups and natural resources. First, attention was given to the positive aspects of group strategy and to the correction of policymakers' neglect of women's collective decision-making capacity as a powerful human resource. Second, the meeting asked questions about the kinds of competition women in groups engage in with respect to resources. Do compete literally for dwindling resources, where they cooperated in the past? If so, what is the prognosis for the survival of women's cooperation? Further, to what extent can cooperative traditions be manipulated by individual advantaged or powerful women within groups? How is collective action reconciled with the tendency for individuals to accumulate privilege for themselves and their immediate families, especially given the context of education systems that place higher value on the acquisition of individual privilege than upon group support?

While it was not possible to find answers to any of these questions within the context of a three-day meeting, participants discussed these and other issues, at length. Ultimately, it was agreed that a research network should be established to give systematic attention to some of these questions within different parts of Africa.

In January 1989 a Women and Natural Resource Management network was established with IDRC funding. It is based at the Environment Liaison Centre in Nairobi, under the leadership of Dr. Shimwaayi Muntemba. The network, which includes anglophone and francophone members from East, Southern and West Africa, as well as a small number of Canadians, is undertaking research in different parts of Africa on women's knowledge of and roles in natural resource management. All of the research is being done within a similar conceptual framework, focussing on women as active actors in resource management rather than as passive recipients of policies imposed from outside.

The papers in this collection give a flavour of the discussions at the York meeting. Not inappropriately, they raise more questions than they answer but as a whole they attempt to address the issue of women's knowledge and experience of natural resource management and to identify some useful avenues for further exploration. The papers begin with an assumption of knowledge and expertise on the part of grassroots women and argue that planners must build upon this knowledge as a means towards more effective national development. Earlier efforts to impose western, technology-intensive knowledge systems on grassroots women generally have led to failures. There is a need for new strategies and if they are to achieve greater success than their predecessors, they must be grounded in traditional modes of interacting with the environment.

The papers fall into three broad categories. The contributions in the first section are overviews of women's role in natural resource management and women's roles in broader social, political and economic development. The majority of the papers, in section two, discuss specific cases having to do with sectoral issues, including legal right, energy, water management, food processing, wildlife management and milk production, all areas of activity in which African women are involved on a daily basis. The papers in the final section are more methodological in focus.

Shimwaayi Muntemba's conceptualization of women and environment in Africa provides a good introduction to some key concerns with respect to women's role in natural resource management. She notes that policymakers systematically ignore the existence of women's knowledge about natural resources, preferring instead a top-down approach with respect to knowledge utilization. She makes a strong argument for the development of strategies for the empowerment of women. Patricia Stamp's paper presents a further conceptualization of the social relations of gender and development. She points out that western development strategies frequently have disempowered women through the imposition of more restrictive behavioural structures and expectations than those which existed traditionally.

Takyiwaa Manuh's paper on land tenure in Africa presents an excellent overview of the extent to which women have been disadvantaged in most African countries with respect to land ownership and even land use under interpretations of both customary and statuary legal systems. She points out that women's needs have usually not been taken into account in resettlement schemes and that many female farmers have had little access to land for independent production or to credit to allow them to improve their farming practices. Fiona Mackenzie's note on women,land and legal systems further explores the difficulties of land access experienced by many women and focusses on the conflicting interests of women, men, the state and aid projects which often restrict the options available to women farmers.

Fekerte Haile presents a detailed analysis of the fuelwood crisis and its effects on women fuelwood carriers in the Addis Ababa region. Her analysis includes not only numbers about the extent to which fuelwood carrying provides a livelihood for impoverished women in the region, but also data on the effects of carrying heavy loads on the health of the women. Olatokunbo Ogbe, in her paper, identifies a number of water management issues which often create special problems for women. For example, she notes that large scale dams and irrigation projects can be disruptive to local peoples, the first by demanding enforced resettlement, the second by contributing to the destruction of soil structures and diverting local water resources to the needs of cash crop farming.

Florence Dovlo discusses research on food utilization. She points out that African research in food science has led to the identification of new modes of preparation for traditional crops such as chick peas. She notes, however, that food scientists sometimes have failed to take consumer preferences into account, with the result that certain foods have remained unmarketable despite their high nutritional value. In her contribution, Ruvimbo Chimedza explores the issue of food security. She notes that there is a critical link between women's management of natural resources and household food security but that this has failed to be recognized in national policy in most African countries. Finally, Bonnie Kettel examines the division of labour in milk production in pastoral societies and makes a strong plea for a recognition of the importance of women's participation. She argues that women underwrite the process of milk production since their labour is of critical importance but they have no herd ownership rights.

In her contribution, Anne Whyte discusses the linkages between environmental perception and decision-making. She notes that women's views of environment often differ markedly from those of men, that all environmental perception is closely linked to local cultural patterns and that effective research on environment and natural resource management can best be carried out using participatory methods. Finally, Eva Rathgeber examines possibilities for effective collaboration between natural and social sciences. She notes that differences in problem perception and methodological approaches make such collaboration difficult but not impossible.

The appendices provide an excerpt from the discussion, which gives an idea of the lively interaction which marked the three days of the meeting. Also included is a statement, prepared by the African participants which identifies some of the most critical problems facing women on the continent.

It is appropriate to end with an acknowledgement of the work that was involved in the organization of the meeting itself. Prof. Patricia Stamp, of York University, served admirably as conference organizer. She was ably assisted by Prof. Bonnie Kettel of the University of Toronto and York University in the conceptualization of the conference. The organizational skills and unfailing enthusiasm of Bridget Ubochi of the University of Toronto were of critical importance in ensuring that the meeting ran smoothly. Finally, the hard work "behind the scenes" of Merlie Glover and Liz Tillett of IDRC's WID Unit must be acknowledged with thanks.

Eva M. Rathgeber
Ottawa, Canada
September 1989

SECTION I

THEORETICAL OVERVIEWS

WOMEN AND ENVIRONMENT IN AFRICA: TOWARDS A CONCEPTUALIZATION

Shimwaayi Muntemba

Research undertaken in the 1970s on women in Africa clearly substantiated and documented the central role women have played in the agricultural systems of sub-Saharan Africa. But it was not until the processes of desertification were brought to the global attention and the most recent and dramatic food crisis publicised, that women's economic activities began to be appreciated within the contexts of ecological and environmental sustainability. Today, many organizations dealing with the environment are giving some thought to the question of women and the environment.

As it seeks for ways in which to feed into policies and developmental pathways, research on women in their socio-economic arenas and activities is beginning to focus on the linkages between the position of women and their accomplishments and the environment, particularly the resource base. The recently published and much talked about report by the World Commission on Environment and Development, Our Common Future, succinctly highlighted human and natural resource management as basic to environment security. Under "human resources," they singled out important roles that women and the young play and should play in sustainable resource management. Other policy and action-oriented organizations -- the International Union for the Conservation of Nature and Natural Resources and the Environment Liaison Centre International as examples -- are developing programmes devoted to women and environment. Many universities and research institutes in and outside Africa wish to make inputs in the debate on sustainable development by researching into and documenting women and natural resource management. The interest and debate this question has generated make it imperative that both research and action provide, as their point of departure solid conceptual frameworks. This would make our understanding of women and environment more meaningful and resulting supportive action effective and sustainable.

The broad framework in which questions of women and environment, can be appreciated seems to me to be that of control and access on one hand and mechanisms for exploiting and modifying that environment on the other. It is the framework of entitlements. Three areas suggest themselves within this broad framework:

- the relations to the key life-support systems of land, water, flora and fauna, which constitute natural resources or the resource base;

- relations to the factors which facilitate exploitation or modification of the natural resources for both survival and developmental requirements. This includes tools of production and other aspects of technology -- plants, seeds, breeding, etc.; knowledge, training and efficient utilization of the human resource; and methods used to exploit and modify the resources;

- finally, there is the area of power and social structures. This area is important because what structures and decision-making machineries and processes obtain will determine access, control and mechanisms for exploitation and modification. Four seats of power seem distinguishable. First, there are power and decision-making structures at the local level. At one end of the spectrum in these structures are chiefs and/or elders and on the other are male kin -- husbands, uncles or brothers. The second level of power structures is the national which put in place policies guiding access to and control over the means and factors of production: the resource base and ways of managing it. Then there is the international level whose, particularly trade, policies can determine modifications to and general management of the resource base. Modes of resource, especially financial flows can facilitate or hinder adoption of sound management systems.

WOMEN'S RELATIONS TO THE RESOURCE BASE

The first question to ask, then, is how women relate to the natural resource base. In the first place we are talking about the legal structures, be they customary or statutory. Customarily, women in matrilineal societies held more secure rights in land than those in patrilineal societies. In the latter societies, access was always through male relatives whether husbands, brothers or uncles. Rights in land under statutory law, technically also termed ownership, excluded women, although they could inherit. Thus the process has been one of dewomanization and patrilinealization of control and access to agricultural land and consequent marginalization of women.

Access and control by women has been further curtailed by the nature of land. Africa enjoys large portions of land as a physical asset. But we know that Africa's land has very limited agricultural capacity. Only 19 per cent of its land is free from inherent limitations, while 44 per cent is in form of drylands. On the national level, much of the 19 per cent is in the hands of the few financially and politically powerful, who hold their land under freehold systems. A number of governments have acknowledged the poverty of land under the command of poor farmers and have embarked on resettlement schemes whereby better-quality land is made available to peasants to enhance their resources. Almost everywhere, men are the beneficiaries. Under the assumption that individual and private title would lead to better agricultural management, some development schemes pushed for land titles in the countryside. In patrilineal societies this closed access to land by women in many cases. There are indications that virilocally married women in matrilineal societies also experience difficulties of access to independent pieces of land. The majority of women who have legal control over land, then, command fragile land and of low productivity.

Access to trees and other flora is another area of concern. Many women depend on this resource for their energy, for supplementary food source and for medicine. In almost all societies, access traditionally was little restricted in that one could collect in someone else's field. However, scarcity and commercialization of the resources has been resulting in unfavourable developments for women. In many cases now, women do not have access to trees and other flora on private land. Since most of them do not have ownership rights in land, they must be reduced to begging or long-distance searches for areas where trees may be common property. In some cases trees under common property are becoming so controlled that permission must be sought from local power holders. In almost all cases, power rests in the non user -- males. Therefore, while it is not denied, this permission is given most sparingly.

Then there is the question of water, in this case for agricultural and household purposes. Africa has very limited agricultural potential, encompassing only 1.4 per cent of the total land area. Nevertheless this potential has been underutilized; only 15 per cent was used in 1982. If land were more fully utilized, production could have increased 24-fold. Yet women are faced with problems of control. In almost all cases and even where not very large systems have been adopted, rights of use do not rest with resource-poor farmers disproportionately represented by women. In some cases irrigation systems were developed for large-scale farming aimed at export crops. In others, as has been the case in some rice-growing countries of West Africa, the systems were introduced specifically for small-scale, resource-poor farmers. Evidence suggests a bias against women even though traditionally, they had dominated the activity.

The direct importance of situating the analyses and action-formulation within this framework raises some fundamental and critical questions: can solid resource management be appreciated and implemented if in many cases major users or at least an important component of the users have been so marginalized? Can the question in the first place be asked outside that of entitlement since the majority of users in Africa-women - have most restricted access and control over the resources?

EXPLOITING AND MODIFYING THE RESOURCE BASE

Central to this is the question of human resource development and utilization. In much of rural sub-Saharan Africa, women and young people form the majority. That women have been involved in activities directly related to the natural resource base makes them a most fertile labour resource. Yet everywhere, developmental approaches have been such that their labour has not been sufficiently exploited. Although women's labour input and workload has been increasing this has been partly because labour productivity has met bottlenecks. In some cases, women have not been or have been inappropriately linked to technology; in others their growing poverty has been leading to a misdirecting and overstretching of this labour. In short, women's potential has not been fully developed and exploited. It has been overstretched but not productively.

Added to this has been the under and/or non-utilization of women's knowledge. Women, as the main users of natural resources, have over the years developed sustainable relations with their ecosystems. For this reason, Africa's fragile ecosystems have survived millennia of years. But twentieth century developments have defined and prescribed valid knowledge. As the world focuses on issues of environment and development, some organizations and individuals, particularly those who are in close contact with people at the grassroots level are beginning to appreciate the value and validity of local knowledge and are demanding that this knowledge be accepted as legitimate and be built on and not overlooked. Viewed this way, then, training would not assume ignorance but would start with what resource users and managers know. Training would augment that knowledge. The methods of training would themselves be developed to suit this reality. Accepting this as a point of departure would empower the people who manage the resources to do so in ways that are meaningful to them.

The question of local knowledge leads us to that of technology and methods of modifying the resource base in sustainable ways. Women who form the majority of resource-poor farmers lack access to more efficient technology, and more importantly, to location-specific technology. Much of the technology in use in Africa has been developed in industrial centres and imported into African countries. This means two things. In the first place, technology is too expensive for most women and they are therefore not reached. In the second place, and more importantly for the purposes of this discussion, such technology is in many cases inappropriate for the fragile ecosystems under the command of women, and other poor people. Developed to suit the needs of ecosystems under the command of rich countries and the rich within poor countries, most technological innovations, whether tools or seed, end up undermining the sustainability of fragile ecosystems. Thus, location-specific technology, where possible developed with the participation of the users, would both build up the management capacities of women and enhance the sustainability of the resource base.

WOMEN'S RELATIONS TO POWER

Although they form the majority of users, women in most cases are as far removed from the seats of power as possible. At the local level, non participation in the decision-making processes imposes difficulties on the ability and capacity of women to manage the resources. Most programmes/projects and technological packages aimed at rehabilitating or preserving/enhancing the resource base are developed elsewhere, be it in governmental or non-governmental offices. Often non-local "experts", capital-based national counterparts, or local men direct and evaluate activities in which women are mere vehicles. At the national level, policies are devoid of user perspectives and therefore in most cases work against the interests of women and their fragile ecosystems. Top-down approaches which are often adopted, negate local knowledge and capabilities and undermine instead of enhance women's capabilities to manage their own resources. But in many situations in sub-Saharan

Africa, national policies themselves respond to the dictates of international economic relations. Thus, the imperatives of growth and development as defined by the rich, the need for foreign exchange and requirements of debt clearing initiate patterns of exploiting and modifying the resources which may not be sustainable and which definitely ensure non-empowerment of the users, especially women. The conditionality of aid and the short-sightedness and in some cases the hidden political long-term objective thereof negate women's struggles for better management of the resources.

STRATEGIES

Any strategies for enhancing sustainable resource management must address and tackle the above issues as a starting point. Some of the ways in which this can be done, at the local and national levels, include:

- empowerment of women so that they have entitlements and with these control over their resources. This implies fundamental reforms allowing women legal entitlements;
- empowerment of women by influencing shifts in power structures to enable them to genuinely participate in decision-making processes at all levels and in all activities;
- providing women with the power to choose which resource to focus on, which technology and which method; and
- augmenting and not casting aside the knowledge that had guided person/natural-resource relationships over years.

At the international level they include:

- challenging the existing international relations in which the needs of the rich dictate the rates of exploiting the resources and mechanisms of their management; and
- reviewing the terms of financial and technical aid flows, paying attention to the nature and extent of local knowledge and people's perceptions.

It is my contention that properly addressed, the question of environment and resource management will push women's issues to the forefront because of women's special position in this area. But to make it possible for strategies to result in sustainable livelihoods and development in which women will also be beneficiaries, the debate and strategies must be placed in proper contexts and frameworks. This paper has attempted to contribute to a search for such frameworks.

'WOMEN IN DEVELOPMENT' AS A FIELD OF ENQUIRY: ISSUES AND CONCEPTUAL PROBLEMS

Patricia Stamp

Toronto, May 1988 —Revised December 1988

INTRODUCTION: THE CONCEPT OF 'NATURE' AND THE ENVIRONMENT[1]

This paper provides a conceptual context for considering the topic of women and natural resources in Africa. It explores the ways in which silence on or misconceptions about women and gender have sabotaged development efforts; as well, it demonstrates that faulty assumptions by experts about 'nature' and 'environment' undermine development. It is worth beginning with the often neglected truth that there is an actual environment with which development research and policy must engage. Unfortunately most development work, including WID efforts, has up to now taken that environment as a given: a known entity which need only form the backdrop for research enquiries and action.

Anil Agarwal, the Director of the Centre for Science and Environment in New Delhi, challenges us to rescue the concept of 'nature' from the realm of timeless essence, and give it a history and a dynamic relationship to human thought and action. In a lecture on the Indian environment entitled "Beyond Pretty Trees and Tigers", he explores the national and international socio-economic processes that have favoured one kind of nature, "a nature that is geared to meet urban and industrial needs, a nature that is essentially cash generating," over another kind of nature, "a nature that has traditionally come to support household and community needs" (1984: 9). And it is the latter nature, the rapidly vanishing one, that is most supportive of women's responsibilities and needs. What Agarwal proposes is that nature is historically selected by dominant forces in society, and actively shaped to their needs. Both the ideas about what nature is, and the actual physical transformations it undergoes, are the products of society. In other words, nature is far from 'natural'. Agarwal's ideas are an excellent starting point for a critique of assumptions about the nature of 'nature' in Africa. It is the unwitting (or disguised) selection of Agarwal's first nature by contemporary socio-economic forces that poses the greatest environmental problems for women and local communities in Africa. It is the second nature that we should identify, analyse and promote if we wish to see solutions to the resource problems of Africa women, and hence of African communities.

The task for scientists and social scientists studying women and natural resources is to rescue from invisibility not only women, but the nature they live in and utilize, and to generate a dynamic picture of the interaction between women and nature. This paper contributes to that task by presenting a thematic overview of some of the conceptual successes and shortcomings of the WID enterprise.

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[1] For a more detailed discussion of most of the issues raised in this paper see Patricia Stamp. Technology, Gender and Power in Africa. Ottawa: IDRC, 1989.

I. ISSUES IN WOMEN AND DEVELOPMENT

Scholars researching women and development have identified a common set of problems throughout the Third World regarding development efforts. Africa shares these problems, although its particular sex-gender systems and historical experience create unique development problems for the continent.

Scholars working on women in development tend to agree that women are caught in a nexus of political dependency. While much of the literature is descriptive rather than explanatory, it does identify women's powerlessness regarding development decisions (see for example Charlton, 1984: 23-28). The dependency approach applied to women and technology sets a useful descriptive context.

Women's lack of choice, and the invisibility of this powerlessness, take on concrete significance in the context of Africa's dependence on women as food producers. Agricultural technology has had the most profound negative impact, not only upon women's ability to maintain their responsibilities as food producers, but upon their position within the village and family. Women's role as primary producers, their restricted access to inputs, and the inequitable distribution of food crop income within the family, go unaddressed in conventional western economic thinking. Yet almost all WID studies reveal that increased farm income as a result of development efforts is appropriated by men and put to uses that do not benefit women and children, while the production involved in generating such income falls largely to women, seriously increasing their workloads and reducing their ability to produce food for the family.

The loss of traditional rights and power in the village and family is a constant theme of the WID literature on Africa. Many studies describe the complicity of development projects in the subversion of women's position. In exploring this process at the local level, I identify five issues regarding the politics of development aid and gender that recur in the WID literature:

1. The technological 'fix'
2. Sexist bias in policy
3. Appropriate technology
4. Income generation
5. Women as 'welfare' subjects

These issues are inextricably intertwined in the experience of African women and African communities. They relate to the politics of aid, development ideology, gender bias in policy, and misguided conceptualizations of the problem.[2]

1) The Technological 'Fix'

The treatment of technology by African governments and by development agencies as a neutral, value free tool, which renders the problems cited above invisible. Development will inevitably flow from a technological 'fix' in this erroneous view.

As Chinua Achebe said, technology is an attitude of mind, not an assemblage of artefacts. Yet, in Anderson's (1985: 59) words,

> The basic assumption persists that technical solutions can be found for any problem. Efforts to develop Science Policy Institutes in many developing countries, to negotiate systems for the equitable transfer of technical knowledge, to develop international journals for the publication and dissemination of discoveries -- even the appropriate technology movement -- all rest on the assumption that a technological "fix" may be found. If we can only get the technology "right," then the assumption is that progress and development in the Third World will be inevitable. Many advocates of women's involvement in development are now searching for the "right" technologies for women to assure their participation in and benefit from development. [Behind this is the belief] that science and technology, because based in nature, are separate from all normative and political influence and free from cultural or class bias. In fact, there is evidence to the contrary.

Anderson stresses the importance of acknowledging the power of these hidden assumptions, and of exploring the link between "access to and control of knowledge and the effective application of technologies in development." A major consequence of the view of technology as a neutral tool is that technology transfer efforts, with relatively few exceptions, have carried with them a Trojan Horse of western economic ideology: development means increased productivity through large scale, capital-intensive enterprise (or at least through intensive commercialization of small scale farming) according to the unexamined tenets of this ideology. Implicit in the ideology is the promotion of nature as a force geared to meeting urban and industrial needs. The technological 'fix' comes from the same hubris manifested in the Western attitude towards nature: that it can always be improved upon by technology, and that traditional attitudes and practices regarding the environment are necessarily inadequate and improvable. Given the negative impact of new agricultural technology upon women in Africa, we must question the validity of the definition of development in these terms.

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[2] Five other WID issues are explored in Technology, Gender and Power in Africa. Under the topic, "the decline of women's power", four issues are: women's unequal access to development resources, particularly sources of capital, collateral and credit; women's loss of legal rights (especially to land), and of political, economic and social autonomy within the community; the disruption of gender relations and undermining of women's power within the family; the intensification of women's labour as a consequence of new agriculture and health technologies, coupled with a loss of decision-making power in the realm of production, health and nutrition. Women often resist development initiatives that they perceive, quite rightly, as contributing to their loss of power and economic control. A final issue deals with a more optimistic topic: the positive consequences for development efforts when women are central decision-makers in the process. Women's decision-making power is predicated upon the existence of effective grassroots women's organizations.

Indeed, those technological changes having the most significant impact upon women are not usually aimed at women at all: large scale development projects and their attendant technology rarely include policy regarding women in their initial stages of planning. The problem does not lie chiefly with projects aimed at women (although these are often problematical as well): rather, as Whitehead (1985: 32) points out, "for large numbers of rural women the most significant forms of technological change are more likely to be the indirect consequences of both planned and unplanned innovations in agriculture as a whole. In many cases, far-reaching effects on women's work derive from the powerful drive to commercialise the potentially profitable sectors of women's work."

In the context of Africa, the drive to commercialize has involved not only foodland, but non-farm productive activities that were the province of women. The consequence has been not only women's loss of income from production, but a dependency on sophisticated consumer goods, often imported or relying on imported inputs. This dependency not only creates debt problems for the country, but poses severe financial strains on the budgets of women, who are traditionally responsible for consumer items. Commodities removed from the realm of local, small scale production to factories include beer, cloth and clothing, bread, bricks, and cooking ware, many of which had traditionally been female productive activities.

2) Sexist Bias in Policy

Although feminists are always hoping for something better, it is not surprising that sexist bias in policy making exists, given the cloistered men's club environment of policy-making. Mohammadi (1984: 4) points out that non-elite men and most women are systematically excluded from membership in policy-making units.

Policy-making environments tend to be a setting within which notions of technology as a neutral tool as discussed above, are easily promulgated. However, it is also the setting where positions far removed from the needs and roles of women can be taken; in many cases, these positions could be assured of no challenge from men at the local level, feeding as they do into popular stereotypes and expectations of women.

Particularly popular with governments (and with many aid agencies) is the 'technological fix' for women's overburdened workloads, which are seen as a major constraint upon development.

Bias in national policy presents one set of problems (see Bryceson 1985); another set exists at the level of field administration, as Staudt's extensive studies on agricultural policy implementation in Kenya reveal (see Staudt, 1985). In a study in Western Kenya, she surveyed 212 small farms in terms of the impact of agricultural services. The services included visits from agricultural instructors, loans, and training, and were structured by an agricultural development policy that included among its objectives the provision of technology "on an equitable basis" (1985: xi). She found that those farms jointly managed by a man, as opposed to female-managed farms of the same size, received a much higher level of service in the form of visits and training, while women-managed farms received no loans at all.

She attributes this inequity to "prejudicial attitudes and ideological bias" (1985: 37) institutionalized in a system where "men dominate administrative offices and political authority networks which provide contacts and information about valuable agricultural services" (1985: xi). Women's exclusion from cooperatives, or discrimination within cooperatives against women members, was one of the most serious aspects of this dual ideological and institutional bias against women, hampering their ability to develop their farming practices, or adopt improved technology. Cooperatives were important sources of soft loans for maize seed and fertilizer as well as of tractor services and high grade cows. Thus, even though almost all the women belonged to organizational networks providing mutual aid and shared labour, they had no means of countering the bias that dominated local policy-making and implementation. According to her findings, sexist bias was the most important factor explaining the inability of women to take advantage of new knowledge and technology (see also Hoskyns and Weber 1985).

3) Appropriate Technology

Once the negative impact of capital-intensive technology began to be recognized, a new approach was adopted by agencies and governments as the basis for development programmes. According to usual definitions of the term, appropriate technology is that which is the most effective and acceptable in any given social, economic and ecological context. The notion of 'appropriate technology' is therefore a relative one, as well as being subjective, i.e. susceptible to the judgement of the users and the providers.

There is no question that appropriate technology is an improvement over earlier approaches. However, evaluations of appropriate technology programmes reveal that a large number of projects do not achieve their objective of improving women's lives in any significant manner. Further, if a criterion of success is the spread of the technology beyond the original recipients, then the record is even bleaker. What has gone wrong? Once again, value judgments by development planners, and lack of account of social and economic impact, have undermined the movement's effectiveness. As Bryceson says, "there is a wide array of technological devices that could reduce women's labour intensive activities in transformation work [i.e.'domestic labour'] e.g. for food processing: grinders, graters, oil extractors, improved stoves, solar cookers, low cost refrigeration; for water supplies: pumps; for transport: handcarts, wheelbarrows, etc. Often these 'appropriate technologies' have met with less-than-hoped-for success because of limited dissemination, limited access or poor design" (1985: 11).

Part of the problem is a lack of clarity as to what is 'appropriate'. Unfortunately, work on appropriate technology often does not escape the economistic bias of earlier approaches (see Ventura-Dias, 1985, for an example). It assumes that non-economic benefits, such as improved health, will flow inevitably from improved market position and from activities that further integrate village economies into the world market; furthermore the traditional/modern dichotomy is implicit in the denigration of customary village technology management (see Part II below regarding this dichotomy).

A further problem is that 'appropriate technology' thinking often discounts the importance of collective village involvement in the technology transfer process. From this perspective, women are passive and problematic recipients of 'inappropriate' technology, a situation that can be fixed by providing them individually, within the 'household' with the means of improving their lot (see Part II regarding the problem of the concept 'household'). And that improved lot is equated with an individual's improved ability to produce for, and improved access to, the market. Ventura-Dias's basic premise is that "the problem of rural women in Kenya is...one of level of income and physical assets" (1985: 157).

Why appropriate technology programmes have not worked must be sought in factors additional to women's low productivity and lack of access, however. Hoskyns and Weber give the clue to the problem:

> Introducing appropriate technologies is not new. Groups throughout the ages have shared or copied others' technologies when they found them appropriate. On the other hand, some groups living next to each other for centuries, in what appear to be similar situations, have rejected the others' tools, materials and techniques (1985: 6)

This statement implies that societies through history have had valid grounds — cultural or environmental — for rejecting technologies available to them. If we start from the reasonable assumption that women are refusing to accept or sustain appropriate technology on sound grounds, rather than out of 'backwardness' or 'ignorance', we can begin to see the problems with the appropriate technology movement, as applied in many cases. Who controls the technology would be the first issue to enter the mind of an African woman. In many projects, technology introduced for the benefit of women has been co-opted by men for their own use. For example, where women have been given carts to carry water and firewood, the carts have often been put to other uses by men (Hoskyns and Weber, 1985:6).

Improved stoves are one of the most popular artefacts of the appropriate technology movement. While valuable in many situations, they have created a host of unforseen problems, however, and have been accepted only slowly and unevenly. Many are not suited for local cuisine; or do not fit the local cook ware; or require women to cook and serve food in daylight, as there is no longer firelight to see by; or requiring cooking in the heat of the day, as with solar stoves; or require purchase in many cases of expensive charcoal in places where gathering of free fuel is still possible as an alternative (only in areas where fuel is habitually purchased, such as in towns, is there large scale reliance on such stoves). Finally, some stove projects fail because they do not take account of polygynous households. Replacing the traditional three-stone fireplace in each hut with a single stove for the 'family' raises the question of where to locate the stove, and how to allocate cooking time upon it. Given that separate hearths materially structure polygynous marriages, the promotion of technology that undermines this practice is bound to fail, or worse, seriously to disrupt the marriage institution.

4) Income Generation

Like appropriate technology, income generation became a pet concept of WID policy. Resting on the same assumption underlying the appropriate technology initiative described above -- that improved incomes for women were the answer to women's exclusion from development -- income generation schemes encouraged women to invest their productive energy in making articles for sale, providing them with technological know-how and (sometimes) the equipment to do so. As Ventura-Dias (1985: 202-204) points out, however, a major reason for the popularity of the schemes is that they do not challenge conventional ideology about the sexual division of labour. Women's 'productivity' would be enhanced, without challenging the prerogatives of men in the sphere of commercial enterprise.

Central to the concept of income generation, therefore, is the notion that this is a 'female' project which is ancillary to the main business of the nation. Skills training, in sewing for example, can be viewed as an aspect of women's 'domestic' role. The consequence for African women is that they are discouraged from viewing themselves as competent individuals making an economic contribution to national production. To make matters worse, whether or not there is a long term, stable market for the articles they are prompted to make, and whether or not there is an adequate transportation and marketing infrastructure, are rarely considered (the World Bank is a culprit in this: see World Bank, 1979). The danger of assistance agencies giving grants to set up non-competitive industries has been documented: the industry often fails once the grant runs out -- reinforcing the prejudice that women are economically incompetent (Tinker, 1981: 78). Further, inadequate coordination leads to contradictions in development policy, whereby the left hand may not know what the right is doing: in Upper Volta, for example, the increased production of millet beer, encouraged by income-generating schemes subsidized by government, was jeopardized by the new Heineken beer factory — also subsidized by government (Tinker, 1981: 78).

The Zambian Association for Research and Development (ZARD) has critiqued income generation schemes. ZARD (1986:82-84) notes the shift in government and local district councils from a bias in favour of home economics instruction for women, to an emphasis upon training for income generation. Among the many projects started was the George Weaving Group in Lusaka, sponsored by the YWCA. For the ZARD scholars, the new approach shares many of the flaws of the home economics approach. Even though a number of women have benefited from the scheme, the majority of poor women have other, more important basic needs. Once again, women's own priorities and needs have not been researched. Moreover, ZARD points out the assumption of the approach that women's most basic need is for income. The arithmetic view of development, as I indicated above, seriously limits understanding of the structural social processes that must be implicated if successful development is to occur.

Another flaw of the schemes is that they do not take account of capital purchases necessary to pursue the craft trained for, such as a sewing machine. Neither do they provide training in setting up a production unit, or in how to obtain credit. For the few who do manage to find work, whether on a piece basis or in employment, long hours and sub-minimum wages are the norm. Meanwhile, Zambian governmental policy has paid little attention to women's main occupation: agricultural production. A further omission is lack of recognition of the increased burden placed upon women. Ironically, income-generating schemes, designed to reduce women's drudgery by generating cash with which to buy goods and services they formerly produced, have increased the drudgery by adding the income-generation labour to traditional subsistence tasks. The meager earnings from craft production are rarely adequate to purchase expensive food and services -- usually from men -- in the market place (see also Ventura-Dias, 1985: 202-205).

5) Women as 'welfare' subjects

There has been a tendency to focus on women as 'welfare' subjects, i.e. as recipients of social service projects, rather than as active agents in development. Once again, their centrality to African economy is overlooked by this approach. Further, the 'target group' approach assumes that there are systematic links through which resources can be channeled to women: an erroneous assumption.

Implicit in all four of the above issues is the conceptualization of women as a 'welfare' problem, to be targeted by development projects. Income generation schemes, as projects to 'give women something to do', participate in this view of women as well. The view is an outcome of the application of the liberal approach to development policy, whereby individuals, or groups seen merely as aggregates of individuals, become the objects of 'projects'. Participants in the important 1984 workshop in Tanzania on "Resources, Power and Women" (ILO, 1985), in criticizing the 'project approach', identified women's income generating projects as a major contributor to the categorization of women's issues as 'welfare' issues. "The orientation of women's income generating projects should be changed from welfare to development. They should be based on women's main economic activities and should be economically viable and profitable" (6-7).

While much of the WID effort of the past ten years has had as an overt purpose the treatment of women as active agents rather than passive recipients of development, the aim has not materialized in a substantial shift away from the perspective. By contrast, the discussion above of bias in policy-making and policy implementation revealed both an ideological and a structural barrier to considering women differently. Regarding the ideological barrier, it is hard to consider women as other than objects when they are excluded, by reticence on the part of extension workers and planners, from decision-making and from receiving instruction in new technology. Regarding the structural barrier, given that women are absent from the formal institutions that channel policy and information, there is an organizational construction of women as 'other', standing apart from the development planning process. But the conceptualization of women as 'other', so deeply a part of western philosophical tradition, has not characterized African philosophy in the past. The way in which women have become marginalized conceptually, in accompaniment with the undermining of their traditional authority and autonomy, is explored in Part II.

II CONCEPTUAL PROBLEMS IN WOMEN IN DEVELOPMENT

While each of the five conceptual problems identified here has been the subject of debate in one part or another of the cross-cultural or feminist scholarly traditions, the challenges to them have not been drawn together into a coherent, sustained critique. Rather, the criticisms have been piecemeal, or even absent in the African context. The first four conceptual problems are:

1. The Public/Private Dichotomy
2. The Nature of the 'Family' and the 'Domestic Realm'
3. The Economic as the Determining Factor in Society
4. The Nature of 'The Traditional' in Society

Misconceptions about all of these are embedded in the literature, particularly in WID writing, and these misconceptions have had negative consequences for development policy making. Inherent in the four conceptual problems is an epistemological dilemma that remains almost invisible in the literature:

5. The Subjugation of Local 'Knowledges'

They are subjugated to a dominant Western 'knowledge' about Africa — and about African women in particular. Flawed development policies can only be corrected if the flawed nature of our knowledge is addressed.

1) The Public/Private Dichotomy

A component of most conceptual frameworks for the consideration of women in the development process is the identification of a 'public' and a 'private' social sphere, respectively the domain of men and of women. The assumption of the reality of this division is the premise upon which are based the 'welfare' approach and the emphasis on 'income generation' to the neglect of women's productive role, discussed above. The division is also a powerful component of sexist ideology and policy.

Few mainstream studies, including most WID literature, challenge the dichotomy, however. Rosaldo, in her influential text book coedited with Lamphere [Rosaldo and Lamphere, 1974: 36] exemplifies the theorization based upon the concept of public/private. While she went on to become her own best critic on this position (see Rosaldo, 1983), her 1974 textbook continues to inform most liberal thinking on the subject. Many argue that the solution to women's disadvantage vis-à-vis development programmes is a more active role in the 'public' sphere; or alternately, a better recognition of the potential contribution of the 'private' sphere. That the dichotomy itself is an inaccurate conceptualization of present African life, and even more so for the past, needs asserting in the strongest possible terms.

Some sensitive studies have documented the porous boundary between what is kept from general view -- the 'private' -- and what is out in the open for all members of the community to see. While women's world is indeed separate from men's, marked by a sexual division of labour and by gender-specific ideological discourse, it is far from private, in the sense we have come to understand it in our western experience (where a private world of the home is supported by law, residential patterns and political practice).[3] The community of women is as full a participant in the decision-making structure of village life as that of men.

Even in Muslim societies which practice the seclusion of women, and where women may be analysed as a "muted group" which is relatively silent on its concerns, compared to men (Ardener, 1975: vii-xxiii, cited in Callaway, 1984: 430), women are able to carry out an active community life. For the great majority of African women who are not secluded on religious grounds, the distinction between a public and private world is even less valid. Wipper (1982); Van Allen (1976); Mackenzie (1986); and Mbilinyi (1986) are among the number of scholars who have documented women's resistance movements during the colonial era.

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[3] Feminist theory has dealt extensively with the public/private dichotomy. See Jaggar (1983) for an overview of the history of the concept. Armstrong (1978) argues that an explanation for the growth of a public/private distinction lies in the growth of the state, and in women's declining ability to control and distribute resources: features characteristic of western society and of African nations today, but not of African society in the past. Even in the present, under the adverse conditions described in this monograph, women retain a measure of control over the distribution of resources that has not characterized western society for centuries.

In the present, while women are largely absent from national and 'formal' political institutions, their political efficacy continues to be manifested at the level of the community. As all the detailed work on women's organizations reveals, and as substantiated in a work on women's associations by March and Taqqu (1986), women's communal organization is one of the most vibrant and effective institutions at the local level. Given that the 'formal' juridical and political institutions imposed by colonialism upon Africa are weak, 'informal' structures have a local legitimacy that sanctions their decision-making authority in the community. However, because women's organizations are seen as 'informal', they are not construed as part of the legitimate political structure. A further problem for the legitimacy of such associations lies in the fact that they operate in a less visible sphere: the world of 'women's affairs'. But this does not make their activity 'private'. The lower profile does not correspond to a low level of public acceptance and political power. To understand the nature of 'public life' in Africa, and of women's role within it, we must abandon the western conceptualization of an opposing private and public space.

The WID literature has argued that it is the public realm that has been privileged over the private realm, by the development process. On the basis of this critique of the public/private dichotomy, I would argue instead that it is the community of men that has been privileged over the community of women. Outsiders, from missionaries to colonial officials to contemporary governmental elites have recognized men's networks as the sole legitimate 'public' with which they should deal — the uniform, undifferentiated 'public' which embodies 'public interest' inclusively. As a consequence, the complex links between the male and female communities, which serve to make of a village a functioning 'public' whole, have been broken or distorted. Concomitantly, women's community has been relegated to the status of 'private' or informal, in conformity with western ideology.

2) The Nature of the 'Family' and the 'Domestic Realm'.

The foregoing discussion regarding the public/private dichotomy bears intimately upon this issue as well. The notion of 'household' is a necessary one, as Bryceson (1985: 11) points out. Far too much of the literature assumes that the 'household' is an undifferentiated unit, however, with no internal divisions or contradictions. Liberal and developmentalist approaches assume that the household may be taken as a unit of statistical analysis, that acts rationally as a corporate entity in the marketplace. Development policies have thus often targeted the household, without considering the differential impact upon its different members.

African sex-gender systems pose special problems for considering the household. The complexities introduced by polygyny are overlooked, for example. Even though a majority of African marriages are now monogamous, the idioms, practices and organization of space is still often structured according to the polygynous marriage, which was the ideal marriage form. As a result of this lack of subtlety in conceptualizing family and household, writers resort to a reductionist attribution of women's problems within the family to 'male domination'-- a vague and ahistorical notion. The simplistic equation of male domination/female subordination carries a particular liability with regard to thinking about women and natural resources. Most studies acknowledge that there are separate men's and women's knowledges, held relatively exclusively by each gender. If it is assumed that women are simply individuals subordinate within the contemporary 'household', rather than complex actors within their marriage and community, then they are relegated once again to the status of passive recipients of dominating practices, whose knowledge is inaccessible, or worse, irrelevant.

A more rigorous, historically grounded understanding of gender relations therefore requires a clearer conceptualization of the African household. A starting point is the recognition that African households have indefinite boundaries. The recognition that women's labour is not 'domestic' labour is a particularly important aspect of this reconceptualization. Not only is women's agricultural work not 'domestic', but their transformation (consumption) activities must be seen in a different light as well. These tasks are an "enabling function for agricultural production. Women spend a great deal of time in drudgery which directly or indirectly contributes to production. A case in point is the provision of water, which has most frequently been defined in terms of social welfare. In fact it is properly a matter for agricultural policy" (Fortmann, 1981: 208).

Given women's vital role both in production and in transformation activities, it is not surprising that men and women in the same family have different interests with regard to development activities. Many studies have documented the fact that men welcome the commercialization of production, while women resist it. In the creating of this contradiction within the family, development activities have fostered different relations between men and the environment on the one hand, and women and the environment on the other. For men, Agarwal's first nature appears to offer immediate opportunities, while for women, the second nature is the only one within which they can continue to carry out their traditional responsibilities.

3) The Economic as the Socially Determining Level of Society

Much of the WID and feminist political economy literature sees economic relations as the source of ideological and political structures and practices. Gender relations, as well, are analysed in largely economic terms, in spite of attempts to theorize sex-gender system as an autonomous structure in human society. As I have shown, a focus on the economic contribution of women, and upon economic dimensions of gender relations, has proved to be an important corrective to conceptualizations of women that treat them as marginal, non-economic beings, inhabiting the 'private' realm and requiring 'social welfare' to correct their problems . Nevertheless, it is time to take stock of the preoccupation with the economic, and to examine our assumptions about it. The practical invisibility of the 'social welfare' (or 'social reproduction') issue of gender and health care in either the WID or general cross cultural literature is suggestive in this regard.

We should perhaps be asking whether the 'productivist model' is an appropriate basis for theories of African social relations, either in the past or present. Certainly, attempts to explain all aspects of sex-gender relations in terms of relations of production has proved problematical for theorists, while overemphasis in WID research on issues of production at the expense of other aspects of development problems has created a theoretical and empirical imbalance in the literature. Mbilinyi (1984) identifies economism as one of the chief priorities for research in East Africa. The productivist model also poses problems for thinking about the environment. The nineteenth century metaphor is a mechanical one: in it, nature becomes a vast supermarket from which production strategies can be chosen. Only economic costs, not environmental ones, are calculated in the bottom line. Once again, Agarwal's first, commercially-oriented nature is served.

As the discussion of 'tradition' below reveals, a fruitful line of research lies in the application of theory about discourse and ideology to our understanding of African political economy. Discourse analysis, whereby power relations are understood to be shaped not only by class forces but by dominant visions of reality, is only beginning to be applied to WID issues. The problem of the relation between power and knowledge is discussed further in section 5 below.

4) The nature of 'the traditional'

Along the same lines of ideological enquiry suggested in point 3, it is important to investigate the ideology of 'tradition' as it pertains to gender relations. Disparate evidence suggests that the challenge of women's demand for rights and improved economic and social conditions is met with the accusation that they have abandoned their 'traditional' responsibilities, and are seeking to undermine the family. Such gender discourse has a powerful effect in the creation of guilt among women, and in stifling their dissent.

The political pitfalls inherent in an ahistorical view of 'tradition' are exemplified by the controversy surrounding the question of clitoridectomy. Western radical feminists excoriated the practice as a 'barbaric tradition', while African apologists defended it, and attacked western feminist interference, in the name of 'honourable and functional tradition'. In neither case, is the appeal to a primordial, unchanging 'tradition' helpful in understanding and solving this politically sensitive and medically urgent problem. An excellent analysis of gender discourse is Francille Wilson's article "Reinventing the Past and Circumscribing the Future: Authenticité and the Negative Image of Women's Work in Zaire" (1982). This study, documents the ways in which an ideology of 'tradition' is promulgated to control and oppress women, serves as an example of the kind of research that might fruitfully be pursued.

Another exemplary study adds an important dimension to the critique of ahistorical approaches to 'tradition'. The Tanzanian feminist scholar Marjorie Mbilinyi demonstrates in her article "'City' and 'Countryside' in Colonial Tanganyika" (1985a) that colonialism created notions of 'traditional life' to serve its own exploitative ends. The Tanganyikan regime constructed a dichotomy between rural 'traditional' African life and urban 'modern' life that transformed indigenous society in the service of "the colonial solution." In reality, the colony comprised on the one hand peasant-based economies, and on the other hand a capitalist sector of commercial urban and plantation enterprises, owned first by German and later British multinational companies, and by individual European and Asian settlers. Both rural and urban enterprises depended on the migrant labour system; the plantations in particular on the largely female casual labour pool. The aim of the regime was thus "to stabilise the working class and restrict African settlement in town solely to permanently employed workers and the middle classes. In order to successfully carry this out, the African extended family system was attacked, and the nuclear family was encouraged. The secondary economy was heavily taxed, regulated, and wherever possible, undermined....Women became central actors and targets in the struggle to impose the colonial solution" (Mbilinyi, 1985a: 88).

In addition to inventing a false traditional/modern dichotomy, the colonial discourse Mbilinyi analyses could be said to pose the public/private dichotomy discussed in section 1 above: the village being the 'private' sphere in western terms, only the town being truly the 'public' domain. On the grounds of both dichotomies, the demands and needs of the 'country' could be dismissed by colonial policy as backward and unimportant. As well, Africans could be labelled as 'foreigners' in their own cities, and controlled as such.

Mbilinyi proposes concrete strategies to combat the biases in both the archival record and historians' interpretations of it. Suggesting that "the same facts are subject to different interpretation, depending upon the group or class or sex with which the spokesperson identifies," she argues for the creation of opposing knowledge. But,

> The creation of oppositional history is in itself a political act. By speaking, writing, acting, drawing, or singing their own histories, people teach one another new ways of perceiving themselves and the world. Defiance of 'official' histories is an act of empowerment....The main audience ought to be the speakers themselves and the popular classes they represent....This suggests

> the production of easily readable texts and other media in the local national languages spoken by the people (96).

Recently, we have seen arguments, both by western commentators and by certain African leaders, that the colonial past is over and done with, and should not be used to explain contemporary problems (see Sender and Smith, 1986). This argument, once more, conspires to reinforce the vision of a backward Africa, where present dilemmas have no history other than timeless African 'tradition'. Any local environmental practices, based on the *second nature* rather than the commercially-oriented *first nature* are necessarily delegitimized by the traditional/modern dichotomy, and construed as obstacles to development. I thus agree with Mbilinyi's view that the recapture of history, including that of the colonial era, is a vital task for the present, both as a corrective to western biases regarding Africa, and as a means of empowering local communities -- and particularly women.

Mbilinyi's proposal (and the work of Tanzania's WRDP in general) offers a valuable tool for inserting women not only into the policy-making process, but into the very process of constructing accurate knowledge about their communities and their problems -- the targets of development policy. It is to the question of the suppression of local knowledge that I now turn, in presenting the final conceptual problem.

5) *Liberating Subjugated Knowledges*

Inherent in all four of the above conceptual problems is a profound epistemological predicament. Competing views of reality are a central aspect of development dilemmas. Studies have chronicled the imposition of the dominant, western 'knowledge' regarding a problem, to the detriment of local 'knowledges' that are more appropriate constructions of local reality. Part of the problem has been poor science: inadequate theories and methodologies for understanding 'the family'; the nature of public life; the history of African societies at both the broad and local levels. As well, understanding of environmental problems has been shaped by an ideology of 'nature' at variance with local knowledge and uses. But this poor science is itself a product of history: emerging as an aspect of and support for the power relations that subjugated Africa. By the nature of these power relations, knowledge of Africa was constructed by non-Africans, according to western categories of thought. The alienation of Africans from their own knowledge of themselves is the other part of the epistemological dilemma. Given the deep differences between the west and Africa in both knowledge and practice of gender relations, and in the construction of female identity, the crisis in knowledge has urgent implications for WID efforts.

It would be irresponsible Utopianism to suggest the possibility of return to a golden age of African self-knowledge (indeed, the suggestion that the African past is more 'authentic' than the African present is implicitly ethnocentric, denying as it does Africans' right to identify themselves as cosmopolitan members of the world community, sharing its modern cultural values and practices). Nevertheless, researchers can no longer avoid the task of investigating the relationship between dominant power structures, past and present, and the nature of knowledge about Africa.

The new school of thought provides a method for an epistemological investigation into how the African -- and especially the African woman-- has been constructed as an object of knowledge. As well, insights on the relation between power and knowledge provide a valuable conceptual tool for understanding the emergence of this knowledge about Africans in the colonial and postcolonial contexts.

This paper makes the implicit argument that contemporary international economic relations, and the aid efforts that are a part of them, constitute a power relation which has shaped, and in turn been shaped by particular "forms and domains of knowledge" about Africa and African women. It is not that the discourse is a coherent and unified one: indeed, knowledge about Africa and its development problems is fragmented among the different loci of research and action, and between different conceptual frameworks.

Finally, in thinking about the utility of discourse theory for feminist political economy and for practical research on women and development, we should pay attention to the French philosopher, Michel Foucault's ideas about "subjugated knowledges", which are directly relevant to the point made above about the suppression of local 'knowledges' -- and about the struggle to retrieve them. Foucault calls for researchers to "establish a historical knowledge of struggles and to make use of this knowledge tactically today" (1980b: 83) The purpose of such "genealogical research" is to "entertain the claims to attention of local, discontinuous, disqualified, illegitimate knowledges against the claims of a unitary body of theory which would filter, hierarchise and order them in the name of some true knowledge and some arbitrary idea of what constitutes a science and its objects....It is really against the effects of the power of a discourse that is considered to be scientific that the genealogy must wage its struggle" (Foucault 1980b: 83-84). It is precisely this task that such feminist practitioner/scholars as Mbilinyi (1985a; 1985b; 1986) and Mueller (1987) are attempting. Indeed, the feminist project everywhere can be construed as an attempt to give women and gender relations a historical context. The task of western scholars and aid agents is to take local knowledges seriously: to rescue them from the "margins of knowledge" and to incorporate them into a scientific understanding of African society. As well, western scholars must recognize the dominant position of their own knowledge in the hierarchy, and the role that knowledge plays in international power relations.

Nowhere is this task more urgent that in the realm of indigenous knowledge about nature. As long as researchers are not prepared to ask Africans questions about the scientific basis for their resource management decisions, then the rational underpinnings of those decisions will remain invisible (see, by contrast, Western and Dunne's excellent study on pastoralists' herd management decisions, where Maasai are revealed to operate from rigorous observation and testing). It is only through respect for this 'science of the concrete' that Agarwal's second nature, supportive of communities and households in a sustainable and dynamic interaction, can be fostered in Africa.

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SECTION II

CASES

WOMEN, THE LAW AND LAND TENURE IN AFRICA

Takyiwaa Manuh

INTRODUCTION

In this paper, the relationship between women, the law and various systems of land tenure in Africa is explored in the context of women's management of natural resources. Since most natural resources derive from land, it is the issues of ownership, control or access to the land itself that determine rights to the use of, or benefits from the soil, trees or crops. In addition, access to water and energy sources for various groups and individuals in society depends on their relationship to land and the scheme of interests and rights therein. In Africa, a large majority of people, both men and women, are engaged in agriculture, fishing, livestock-rearing, herding, hunting and forestry under increasingly difficult conditions. For these pursuits to guarantee a livelihood for Africa's peasants, the right to land and cattle, the condition of soils, trees and water systems thereon and preservation of the economic system need to be assured, and some papers in this volume address these issues specifically (see especially the papers by Chimedza; Kettel; Haile and Ogbe).

African agriculture has been characterised as resource-poor, mostly rain-fed and subject to vulnerable conditions on land which has many inherent limitations and low irrigation potential (Muntemba 1986). With the high rate of population growth, drought, famine and Africa's deteriorating economic and social position, there has been a massive decline in the quality of life for the majority of Africa's people, especially rural dwellers. There is accordingly the need for the development of sustainable agricultural systems and prudent management of the resource base to ensure food security and prevent environmental degradation. The predominance of women in agriculture in Africa is well known, with Africa characterised as the region of female farming par excellence. In addition, women are responsible for most of the fuelwood and water collection for domestic uses or for sale. Among pastoral peoples also, women share the responsibility with men for producing or searching for fodder for cattle. Although they do not generally own livestock, women have been found to have substantial use-rights in livestock, somewhat akin to women's use-rights in horticultural societies (Badri 1986). Women's contribution to food and cash crop production and their labour, waged and unwaged, casual and more permanent, on plantations, family farms or their own plots has been noted to have had a stabilising effect on agricultural production in many parts of Africa, especially in the context of male migration. Particularly in the conditions of increasing commodity production for the international and domestic markets, the agricultural labour force has become feminised; this paper examines the struggles waged and the strategies employed by women to retain control over the product of their labour and to assure for themselves an independent income in all these productive activities.

At the heart of the struggle for control of and rights to land and other resources is the relationship of individuals and groups to the state. The pressures that groups or individuals are able to exert to get the state to act in their interests depends on their class locations; thus powerful groups are able to get legislation enacted which strengthens their positions in relation to land and other resources. Of particular significance in this regard is the plurality of legal systems established by colonialism and continued in the contemporary era whereby new legal forms have been introduced which have often been used to dispossess rural people of their land in the 'national interest'. The schemes of land reform, land consolidation and resettlement initiated by the state have also often marginalised peasants and turned them into rural proletarians and increased the numbers of female headed households. On the other hand, agribusiness, absentee farmers and richer peasants have profited, leading to the enhancement of class, gender, age and other inequalities within societies. In most parts of Africa the land question has not been solved; the maintenance of plural systems of land tenure has served to undermine customary land tenure for poor peasants, most rural women and landless labourers in conditions where there is institutionalised non-access to credit, inputs and technology for them.

These then, are the central issues to focus on the elucidate the relations between women, the law and land in Africa and this paper provides an assessment of changing customary law rules and practice, legislation, and various land schemes to bring out their effects on women.

LAND TENURE SYSTEMS IN AFRICA: A REVIEW

Land tenure systems in Africa are basically of two types. The first based on customary law, was predicated on an ideology of communal ownership with kinship as the organising principle of social and production relations. Through membership of a lineage or clan, individuals theoretically had access to the chief means of production, land, which was vested in clan elders, chiefs or religious functionaries who allocated it to various families. Over time, citizens' use rights became virtually indistinguishable from full ownership and also became heritable estates. Since production was normally done on a cooperative basis with kinsmen providing labour services for various tasks, the resulting produce was perceived as ultimately belonging to the kin group and inheritance patterns and practices tended to retain land and other property within a kin group of lineage. But in practice, property passed to smaller units within the group, with children or brothers as the inheriting group in systems practicing patrilineal descent, and nephews or brothers as the inheriting group in matrilineal systems, and attempts could be made to challenge gifts to persons outside the prescribed circles (Crummey 1982; Swantz 1984).

Land which had not been allocated to families remained the patrimony of the whole community, part of which developed into forests, village woodlots and grazing land, and provided fuelwood and fodder for animals. These lands also served as community reserves for the collection of wildfruits, relishes and other natural produce and were important for maintaining ecological balance.

In conditions of low population, little or no commodity production and plentiful land, there was no impetus for land alienation; land use patterns which were intimately bound with the religious and cultural beliefs and values of various communities, maintained the ecosystem and ensured relative abundance in years of good rainfall.

Over time, with the development of commodity production, exchange and long distance trade among societies, the egalitarian nature of land tenure changed. Chiefs, elders and family heads acquired vast property in land in parts of Africa and markets in land developed in pre-colonial kingdoms, as for instance in the Funj kingdom of Sinnar and in Bagemder Amhara, Ethiopia (Spaulding 1982; Crummey 1982). Even where outright alienation of land did not occur, the development of the pledge as a form of security for a loan testifies to increasing differentiation among the peasantry and the growing importance of commodity production and exchange relations.

But it was with the advent of colonialism that customary land tenure was almost everywhere overlaid with varying degrees of European law and usages, and new systems of tenure emerged. In areas of settler colonialism such as in Algeria, Kenya, Zimbabwe and South Africa, the most fertile lands were taken over as Crown or public land for European settlement and the development of large-scale commercial agriculture. Africans were dispossessed of their lands and forced into native reserves, 'tribal' trust lands, or became squatters on European farms. The discovery of minerals and the resulting mining activities disenfranchised native populations of huge tracts of land as concessions were granted either by a quiescent colonial state or by chiefs and elders on paltry terms. The setting up of plantations accentuated the process of disenfranchisement and a real land hunger emerged as commodity production for the international market grew. The taxes imposed on the population and labour recruitment drives for the mines and plantations resulted in massive migration from reserves to mine-compounds and plantations under highly exploitative conditions. In this situation, the burden of food production, cattle-raising and the sustainment of local communities fell on women who in addition often subsidised the inadequate wages of their menfolk. The absence of adult male labour and inputs for cultivation, the non-recognition of women farmers by the colonial state and their ineligibility for credit and other facilities and the concentration of colonial agricultural policy on growing export crops for the international market severely distorted production in the native areas and tended towards crisis. These developments and their continuance by post-independence regimes albeit in attenuated forms, are responsible to a large extent for the crisis in agricultural production for domestic purposes in most African states.

In areas of Africa where no settlement occurred, and where customary land tenure was ostensibly allowed to continue, the introduction of European property forms reduced the space available to local communities, and leases were drawn up granting estates in 'fee simples' and other alien forms. The increasing commoditisation of production for export facilitated the development of private property in land on a large scale and its corollary, land alienation, and the courts unheld these new developments, though not without challenge (see Asante 1975, for a discussion of the Ghanaian experience). The establishment of cash crop farms of cocoa, oil palm and copra in parts of West Africa, the large investments required to undertake them and their perennial nature effectively meant that such lands no longer formed part of communal land which could be reallocated. As the pressures of cash needs, population increases and land shortages led to large-scale migrations in search of better opportunities for a livelihood, generations of landless labourers and sharecroppers emerged who entered into various contractual and tenurial relations with landlords, plantation owners and more prosperous farmers. A peasant could rent land under different sharing arrangements; he could also merely be a licensee with rights to the use of land for a fixed period, with limitations as to what crops to grow. It is under these forms of tenure that many women who did not have traditional use-rights in land were able to obtain cultivation rights and to earn an income.

In the contemporary period, land tenure regimes in most countries are pluralistic, consisting of varieties of communal tenure and tenure governed by legislation. While the more discriminatory provisions relating to land tenure have been largely removed in each country, in practice in most countries, the dominance of certain interest in agriculture has continued. Thus even though in settler colonies some settler land was returned to peasant cultivation, the amounts of land involved were inadequate and increased problems of squatting. In Zimbabwe for example, under the terms of the Lancaster House Agreement, a willing seller/willing buyer clause was incorporated to facilitate land transfers to Africans. However as recent studies show, the land question in Zimbabwe today is unresolved, despite being a central issue in the war of liberation (Weiner 1988). In the so-called communal areas located in variable ecological zones, the process of social and economic differentiation is intensifying, with disproportionate investment going into communal areas with the greatest agricultural potential. Elsewhere in the communal areas, families have been found to be landless or to have small landholdings on marginal land, and their association with poverty and tendency towards crisis was high where there was no adult male labour or remitted income. On the other hand, in the white-owned large scale commercial farms which produce the bulk of Zimbabwe's exports, there is gross under-utilisation of land, more capital intensive farming practices and a displacement of farm labour. Despite the Land Acquisition Act which gives the state power to acquire underutilised land for resettlement, it has not been possible to do so as underutilised land is incorporated within existing farmsteads upon which the state depends for export earnings.

In a number of countries, programmes of land reform and consolidation have been attempted, and in Kenya and Zambia for example, almost all land was adjudicated, consolidated and registered by 1975. This process which did not affect the dominant position of white commercial farmers often resulted in individual males being given title to land as against women, and it is reckoned that in Kenya, women constitute a mere six per cent of title owners despite their predominance in agriculture.

Land reform programmes have also been undertaken in countries as diverse as Algeria, Senegal, Ethiopia and Mozambique, and in some of these countries, it has served to give peasants land rights. Often however, land reform has merely been a vehicle for accumulation by richer peasants or bureaucrats. In few areas have the rights of women and poor peasants been considered. In Mozambique, attempts have been made to guarantee land rights to all cultivators, but the continuing state of war and tension has hardly allowed these rights to be fully utilised. Ethiopia's land reform programmes has affected those who are organised in cooperative schemes in the rural areas of their birth, and Fekerte Haile's paper in this collection suggests the limits of these programmes in the Ethiopian context.

Coupled with land reform and consolidation are rural development schemes which have involved resettlement, and Tanzania's villagisation scheme stands out as the most ambitious to date to resettle thousands of rural families. Typically on these schemes peasants are given plots of land to cultivate on an individual or cooperative basis, and irrigation facilities, seeds, and other inputs are provided to produce high-yielding varieties of crops with market potential for domestic or export purposes. The beneficiaries of these schemes have been richer peasants, often male, or absentee farmers with connections to the state, and these also benefit from the extension and credit facilities usually accompanying. Women's use rights in land as wives or widows have largely been ignored on such schemes and to survive, they have had to return to wage labour on these projects or sometimes to flout laid down regulations as to what crops to grow (Konings 1979; Jackson 1985).

For most peasants with little or no land and dependent on customary land tenure, share cropping arrangements with private landlords have become the most salient means to gain cultivation rights, and these arrangements have proliferated. In the absence of a resolution of the land question, and the increased need by peasants to engage in commodity production, these sharecropping arrangements have become a means for exploiting peasants by rapacious landlords. In Ghana, the Rent

Stabilisation Acts and Farmlands Protection Act now repealed, sought to protect smallholders and to limit the amounts of ground-rent which could be charged. Largely, however, peasants have been left to their own devices to cope, and unless they come under a resettlement scheme or rural development programme, their daily conditions of existence are ignored by the state and its functionaries.

The state meanwhile has reserved to itself powers to compulsorily acquire land in the 'public interest', and in that way to abrogate the rights of former owners or users of land, subject only to the payment of compensation. The state is the owner of all minerals, timber and forests found within its boundaries and grants concessions and licenses to companies or persons to exploit these on terms. It is in this administrative capacity that state functionaries and their allies are able to effectively expropriate rural people of their land and other resources. But often, without any legal authority, local people enter into forests and cut timber or enter into game reserves to hunt and seek to regain some of their lost rights, sometimes at some cost to the environment, Fekerte Haile's paper on women fuelwood carriers in Ethiopia makes these points forcefully.

WOMEN, THE LAW AND LAND TENURE

In this section we discuss the nature and content of women's rights in land over time to bring out the changes which have occurred. Together with men, women have been subject to the erosion of communal ownership and the state's expropriations. However, given that women's use rights in land in most parts were usually inferior to those of men, the impacts of these changes have been to marginalise them and make them more dependent on others for land rights or to seek alternative means for earning a livelihood.

Usually in discussions of women's land rights, a distinction is drawn between groups practicing matrilineal and patrilineal descent. In matrilineal systems, women, like men, had usufructuary rights in land based on their position within the matrilineage which they could exercise on non-marriage, during marriage, upon divorce or widowhood. They could inherit land and pass it on to their children. The system of uxorilocal residence associated with matrilineal groups also meant that women could maintain their independent activity and acquire property over which their husbands had no rights and the meticulous application of customary law rules ensured this. But they also owed labour obligations to husbands and assisted them in cultivation. They could be given plots of land by husbands on which they grew so-called "women's crops," such as groundnuts and beans. Women in matrilineages could become family heads and administer family or lineage property, but were usually assisted by men in doing so.

In patrilineal systems, women's land rights were dependent on their relation to a male, usually a father, brother, husband or son. Most women did not inherit land in their own right or where they did, they inherited half the amount that their brothers did, as among the Anlo of Southern Ghana, and could not pass it on to their children. Generally, it was through marriage that women acquired use rights in land, and husbands would assign particular fields for cultivation and particular cattle to each of their wives according to their productivity and the number of their children. From these fields, women produced vegetables and condiments for the family meals and could also exchange any surplus. Upon widowhood, women as guardians of minor male heirs could take charge of a house and farm, and manage it until the son grew up. Women with grown-up sons were assured of cultivation rights or at least of maintenance, and it would appear that childless women or women who bore only daughters were in a precarious situation.

But in both matrilineal and patrilineal systems, patriarchal ideology was very strong, and with increased commodity production, women's land rights were not always assured. In matrilineal areas, women served more as channels for transmission of property to males and often did not inherit land themselves and inheritance principles changed to make men preferred inheritors over females in matrilineages (Mikell 1984). In this situation, the existence of the sororate and levirate, forms of widow inheritance, in various parts of Africa served to ensure continuing use rights for women in fields they had cultivated during marriage. Refusal to marry the successor meant the cessation of cultivation rights.

Under colonialism and widespread commodity production, use rights in land deteriorated, and these have been well documented in a growing body of studies by feminist and other scholars (see for example Boserup 1970; Sacks 1979; Okeyo 1980; Muntemba 1982).

In general, women's usufructuary rights even in matrilineal systems were eroded in the conditions of land scarcity and individualisation of land tenure, while well-placed men acquired ownership of land and control of its products. In these conditions, there was a reduction in the larger lineage control of land, and inheritance principles contracted to focus on the immediate or individual family (Swantz 1984:80; Mikell 1984). But whereas men migrated in large numbers to seek land or wage work elsewhere, women's mobility was limited, and they usually accompanied husbands or other kinsmen.

The role of the law, customary and colonial, was instrumental in reinforcing these changes and new property forms were introduced and recognised. But at the same time, customary law resisted some of these attempts, and some old property forms have survived. There is thus a clear difference between a pledge and a mortgage, and a pledge has been held to be redeemable, notwithstanding the lapse of time. This is an important way in which local communities have sought to hold their own against the influx of new usages and capitalistic forms. But at the level of gender relations, this was not true, and Chanock (1982) in a general context, has discussed the ways in which customary law was made, or rather re-made, to fit the new times and to aid elders and males to regain control over women. Fluid accounts of relations at work were ossified into rules, and male claims legitimized as customary law. Men and elders re-made customary law in order to control women's sexuality, divorce and the licence that the new social conditions permitted (see Engle 1982). As females became more aware of the social alternatives available and deserted husbands or moved into waged labour, the colonial courts aided male elders in asserting non-existent rights (see also Roberts 1987, for a discussion of the attempt by a traditional Ghanaian state to regulate marriage).

That women were not passive in the face of these changes is shown in their desertion and divorce rates, resort to prostitution and outright refusal to enter into marriage (Obbo 1980; Hay 1982; Swantz 1984). In other places, women began to assert a right to the product of their labour and where they were given plots for cultivation, sought to retain moneys earned from the sale of crops. As a Malawian study shows, until the collapse of peasant production in parts of the lower Tchiri Valley in the 1930s, co-wives diversified their farming to minimize co-wife rivalries and grew cotton for sale on their plots. The village system of justice recognised these rights and enforced them in the events of legal action (Mandala 1982). A major case study of the effects of commodity production on kinship relations among matrilineal groups in Ghana has also shown women's expectation of reward for performing labour services regarded as customary to husbands (Okali 1983). Women and their children expected to be compensated in the form of gifts of land for their own cultivation or the creation of separate farms for themselves and their children. Where these rewards were not perceived as forthcoming, women would refuse to join their husbands in new farming villages, resort to divorce or even go to court to press their claims. Other women with resources also purchased land and made farms in their own right.

WOMEN, THE LAW AND LAND TENURE IN THE CONTEMPORARY PERIOD: KEY PROBLEMS AND ISSUES

The previous section on the review of land tenure systems in Africa has sought to set the context in which women operate in relation to land and other resources. The discussion on women and land tenure has shown the changing content of women's land rights and the negligible differences between matrilineal and patrilineal systems as far as women's land rights are concerned. In this section, we present a few examples to show key problems and issues around land for women in Africa today and the coping strategies that women adopt in face of these problems. Particularly in the present when governments all over the continent are adopting and applying programmes of structural adjustment with a de-emphasis on the state's involvement in provision of facilities and services, the control of resources by individuals and groups becomes crucial to their survival. However, by its emphasis on exports of primary products to earn foreign exchange, the state places in jeopardy the livelihood of rural people through the environmental degradation inherent in these policies. Timber is cut down rapaciously and there is intensive cultivation to produce more coffee, cocoa, groundnuts and other export crops. At the same time, there is the movement of big capital into agriculture, facilitated by governmental acquisition schemes or governmental pressures on local communities to release land to outsiders for large commercial ventures. In the process, peasants are turned into labourers on their own land.

The resettlement schemes which have taken place in many parts of the continent have been conceived by and for men and while the labour power of women is utilised, women rarely have been granted title to land in their own right. Thus while under the villagisation scheme in Tanzania the Village Act demands that each village member be allocated a separate plot of land, in practice land is allocated to household heads in many places, and women are not involved in the decision-making or implementation of land distribution. Brain (1975) uses a case study of a village settlement scheme at Bwakiri Chini, Tanzania, of mainly matrilineal groups to argue that women in the settlements were worse off than in their traditional villages. They no longer enjoyed their traditional use rights in land, but were now dependent on their husbands for land, and had to leave the settlement in the event of divorce or widowhood. At the same time, they would have lost their former land rights by absenteeing and would have to beg for new land or enter into share-cropping arrangements.

This failure to recognise women as cultivators in their own right or as heads of households with obligations to support children and other household members has persisted in the design and implementation of many projects and in agricultural policies. Women are excluded from extension services, do not have access to credit or new technology and are then designated as backward or ignorant farmers. Jackson's (1985) study of the Kano Irrigation Project in Nigeria and its impacts on women is an illustration of this practice. However, women have not remained passive in the face of such developments and often devise strategies to resist the undermining of their power. The Kano project which is located in an area of high population density involved irrigating 120,000 acres of land to grow wheat, the levelling of land by management, the provision of credit for two years, and the further provision of fertilizer, seeds and water at cost. Individual titles to land were registered and irrigated land was exchanged with equivalent non-irrigated land nearby. While the stated objectives of the project were to increase food supply, provide employment and improve the standard of living, in practice it has had deleterious effects on local production and nutrition, women's economic power and gender relations. The scheme caused a loss of traditional crops such as sorghum, important tree crops, vegetables and other crops. It also undermined relations between the agricultural Hausa and the nomadic Fulani under which the two groups supplied each other with vital products for daily food. Fulani women could not pass through the embarkments to sell the Hausa women milk with which to make fura, millet paste balls. Further, by its banning of household poultry-keeping, the project attempted to deprive the population of an important source of protein. But the women defied management and still kept domestic animals and grew rice to feed their families and for sale (Stamp 1987).

One way out of their predicament for women on the project site has involved proletarianization (see also Konings 1981, for comparable Ghanaian data). While women in purdah dried and sold tomatoes to gain some measure of economic autonomy, older non-secluded women went out to work for low wages, for the multi-national company which grew vegetables for the European winter market. In this way, they gained more autonomy and money than they would have had working for husbands or male kin.

In Ghana, a number of studies have brought out the changes that have occurred in women's resource control in conditions of land shortage and intensification of production and the ways in which women have sought to cope. Patten and Nukunya's (1982) study of shallot farmers in Anloga, South-eastern Ghana, shows how inheritance patterns have changed under increased demographic and ecological pressure, and a fragmented land base. Traditionally, daughters inherited half the amount of land that sons did, but currently, they do not inherit land if they have brothers, and even as the input of female labour on land has increased, the access of women to use rights in land has diminished. To compensate for the loss of their traditional access to productive land, women have consolidated their control over the marketing of produce. At the same time, women constituted one third of members in some cooperatives, but were distinguished from male members by the fact that none of them had access to enough land to permit them to farm full-time for a living. They invested some of their trading profits in renting land or making sharecropping arrangements, and while 100 beds in cultivation was considered the minimum, none of the women held more than 30-40 beds. Further, the authors found that shallot farming tended to be more cash-intensive for women than for men because it was necessary for them to hire virtually all the required labour since they were rarely able to perform all the farming tasks themselves.

The use of trading profits by women to acquire land and other investments have been noted by other authors. In East Africa, Obbo (1980) has remarked on women migrating to towns after divorce or widowhood and using the proceeds from prostitution to purchase land in their natal villages in a situation where they had no use rights in land.

For women with little or no money, there is increasing resort to sharecropping arrangements whereby they are granted oral licenses to farm for a season or other fixed period. For poor landless women or the wives of migrants this may be the only means to acquire land for cultivation. But sometimes onerous conditions are imposed and landlords may demand a share of the produce or a cash payment. Women's ability to farm seriously for themselves is limited by the labour services they owe to husbands or other kin, and they usually can cultivate only small plots of land. In Ghana it is as widows or divorcees that women, freed of labour services to husbands, could migrate to seek greater economic autonomy as own account farmers. Where they had money they could buy land, but traditional land holders have been reluctant to deal with single women and preferred to allocate land to men or to women accompanied by husbands. Thus in other places such as in Zambia, women have purchased land but put it in the name of a man to conform to patriarchal ideology, and the abuses that this could lead to are more than evident. A similar situation pertains to married women in Lesotho where the combination of Roman Dutch law and customary law conjoin to make women's property rights virtually non-existent.

In most parts of Africa, women have sought to deal with their landlessness in individual ways. Through marriage or other alliances, trading or other pursuits, some women have been enabled to have access to land. As has been noted, other women have entered into share-cropping arrangements. But increasingly, women are resorting to cooperative ventures whereby land is acquired by purchase or grant through their own or an outside agency for a productive activity. The increasing numbers of village women's groups around the continent are becoming a means for women to gain cultivation rights through joint efforts. Such groups attract the attention of community development agencies, and it is easier for inputs such as seeds to be channelled to them and credit facilities arranged.

The provision of credit for rural dwellers in general and rural women in particular is an urgent problem as the lack of it fosters dependence on usurers and money lenders. Indebtedness is a major problem in rural areas and through pledging and mortgages peasants lose their land as a result of their inability to redeem. The insistence by most credit agencies on collateral in the form of registered landed property places women at a disadvantage, and rural women are not seen as credit-worthy. In some areas where there is abundant land which could be let to women under some arrangement or acquired by purchase, the lack of cash becomes the main constraint to production. Other identified constraints are the lack of extension services to women, tools or inputs.

Since the U.N. Decade on women, the constraints that women face in relation to personal and national development have been highlighted in conferences, seminars, and development plans. The establishment in most countries of national machineries on women has led to more investigation and data-collection on the lives of women, and the setting up of WID units in international bilateral and multilateral agencies has also helped to foster a consciousness of gender issues and perspectives. The problems of rural women have come to the fore in most discussions and governments have been urged to make legislation and adopt policy measures which impact positively on women's lives.

In both Kenya and Ghana for instance, succession laws have recently been passed which seek to grant land and other rights to women. In

Ghana, the provisions of the Interstate Succession Law 1985, grant definite shares to women and children in the estate of a deceased spouse, and this estate has been defined to include both movable and immoveable property. An interesting consequence is that sons and daughters share in the estate equally, and this would then have the effect of granting land rights to all irrespective of gender. However it does not appear that as yet, the law is understood fully or implemented in most communities.

At the level of policy, despite the setting up national machinery on women and the ratification by most African governments of international conventions relating to women, little has changed on the ground; women's needs and concerns continue to be peripheral to the main thrust of governmental policy and action, and are left to be resolved by individuals or in the form of projects for women by a variety of donors and actors.

CONCLUSION

The review of land tenure systems in Africa and the presentations of women's position within these systems has brought out the somewhat similar positions of women across Africa despite differences in matrilineal or patrilineal forms of descent and East or West. This is because each African state, to varying degrees, is firmly integrated into the international capitalist market through production of cash crops for export. In such conditions, control of land, and other factors of production becomes a crucial determinant of economic power. The growth of agri-business in Africa, the state's increasing use of compulsory acquisition of land often to the benefit of foreign capital or powerful local interests and the movement of urban-based businessmen and military officers into rural areas as absentee farmers, have all served to reduce the amount of land available to rural populations. These developments accentuate existing local inequalities and worsen the already precarious existence of poor peasants, and landless labourers, the bulk of whom are women, in the conditions of resource-poor agriculture in Africa. The increasing indebtedness or rural dwellers and the pledge or mortgage of property to secure debts or loans and their ineligibility for credit facilities contributes to their poverty.

So far, law as an aid to land access has consisted in compulsory acquisition of land for resettlement, and changes in family and other law which grant definite shares in property to women and other defined groups. Yet as the Tanzanian experience among others clearly demonstrates, law by itself can do little to change social relations or to eradicate gender-based inequalities. Giving actual rights to women would reduce the pool of cheap, unpaid or poorly paid workers in the nebulous category of 'family workers' and would threaten accumulation. Where the law is reformed to grant shares in property to wives as has happened in Ghana, this serves to assure the property rights of wives and children of large property owners and some smallholders, but affects in no way those who have no property. The lack of credit facilities through banks and other institutions also leads to the reliance of rural farmers on usury and the consequent sale of their farms when they cannot pay their debts. In this way, land is permanently alienated and cannot be inherited even by those whose rights are recognised in law.

Surprisingly, little attention seems to have been paid by the state to various tenancy and sharecropping arrangements through which the bulk of landless peasants obtain land. Little protection exists by way of fixing the maximum limits of ground rent and prohibiting the imposition of onerous conditions on cultivators.

In order to tackle the many constraints that rural women face in relation to land, there is the need to use a combination of methods. Women's land rights must be guaranteed in law by removing prohibitions on women's use rights which exist in the different systems of land tenure. Secondly, in resettlement schemes, women's need for land for independent production must be recognised, and female heads of households must be given land alongside male household heads. Given the existence of polygynous households assuring women rights to independent production is their best form of security. Another important means for guaranteeing women access to land and productive resources are cooperative ventures where peasant women exercise leadership and decision-making powers and have access to credit, inputs for production, technical advice, and marketing facilities. The establishment of rural banks which lend to persons engaged in productive activity after inspection of their farms, for instance, will solve some of the credit associated problems for peasants and free them from usurers.

At the same time as efforts are made to assure women access to land to produce on their own or in cooperative ventures, women's access to communal land and a recognition of their use rights therein must be secured. In many countries, the declaration by the state of lands as concessions and reserves have abrogated the rights of the former users. Even as there is the need to preserve forest and wildlife, there is also the need to recognise the intimate links that communities have developed with such natural resources. The preservation of forests and wildlife cannot only be the duty of forest guards and game wardens and needs the active involvement of rural communities, especially women. The development of agro-forestry schemes therefore which are based on the involvement and participation of local people will serve to guarantee their access to forests and other products while at the same time maintaining the environment.

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WOMEN FUELWOOD CARRIERS AND THE SUPPLY OF HOUSEHOLD ENERGY IN ADDIS ABABA

Ferkerte Haile

INTRODUCTION

In Ethiopia about 93 per cent of the energy requirement is in the form of firewood, charcoal, dung and crop residues. Of an estimated annual per capita consumption of 205 kg[1] of oil equivalent only 6.5 per cent comes from petroleum products (United Nations Development Programme/World Bank, 1984). The gross energy supply in the country, based on 1982 estimates, is about 8.9 million toe[2] and the final consumption is 8 million toe. The domestic sector consumes 92.8 per cent of the energy (7,436,000 toe in 1982) whereas industry and transport takes 6.5. In relation to biomass fuels the annual production is less than the annual consumption. In 1980 about 24 million m^3[3] of fuelwood was consumed whereas the national allowable annual cut was estimated to be only 13 million m^3 (Tekele himanot Z., 1984). The deficit is covered by forest clearing and over-cutting. The implication of such an accelerated rate of deforestation on the environmental, economic and social well-being of the society is far reaching.

At present, the city of Addis Ababa is faced with a serious fuelwood shortage. Considering forests within a radius of 100 kms of Addis Ababa, the demand for fuelwood exceeds the supply by about 75 per cent (Ethiopian National Energy Committee, 1981). To date, this imbalance has resulted in an accelerated destruction of the poorly managed forests around Addis Ababa. This deteriorating situation will aggravate the problems of shortage and cost of woodfuels for household cooking in the city.

The supply of fuelwood to the city comes from both the state sector and the private sector. The government transports fuelwood from a radius of various distances and distributes to city dwellers using depots located at different zones in the city. The private suppliers include peasant associations around the city who own and manage the forests, fuelwood carriers who either buy or collect biomass fuels and supply to the city and private stores in various kebeles (sub-district).

Thus, while Wood and Charcoal Products Processing and Marketing Enterprise (WCPPME) under Community Forest and Soil Conservation

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[1] kilogram

[2] tonnes of oil equivalent

[3] cubic meter

Development Department (CFSCDD) supplies about 20% of the city's requirement using its 35 depots, the major supply of fuelwood to Addis comes from fuelwood carriers, peasants and licensed traders. Therefore, there was a need to properly study these fuelwood sources.

This project was initiated to study women fuelwood 'carriers' in and around Addis Ababa for the purpose of urban policy and planning. A significant proportion of the fuelwood requirement of Addis Ababa with a population of 1.5 million, is mainly supplied by women who cut or gather, transport and sell fuelwood, branches, leaves and bark to the city. The socio-economic implication of such activity had not been studied. Hence, this research was designed to investigate the social and economic impact of the activity vis-à-vis the productive and reproductive roles of women in the community.

The study was planned with objectives of:

a) estimating the number of fuelwood carriers in and around Addis Ababa;

b) estimating the volume of fuelwood supplied by this group; and

c) assessing the socio-economic impact of wood carrying activity.

MATERIALS AND METHODS

A structured questionnaire was formulated based on a pre-survey carried out prior to the study. The questionnaire was developed to generate data on:

- bio-data of fuelwood carriers,
- distance covered in transporting/carrying fuelwood,
- the weight of the burden vis-à-vis the weight of the woman carrier,
- frequency of trips in transporting fuelwood and number of years in the job,
- monthly household income and expenses,
- common problems associated with fuelwood carrying,
- carriers' views about the value of the forest product and its management, and
- alternative means of employment for this sub-population.

To undertake this survey, the city was systematically divided into five major routes which supply Addis with fuelwood. These routes were Gefersa Area, Gojjam road, Entoto Mountain, Asmara road and Jimma road. From these five areas a total of 303 fuelwood carriers were both randomly and systematically selected as they brought in biomass fuels to the city. The questionnaire interview method was supplemented with actual observation, interpersonal and group discussions. Fuelwood carriers and their burden weight were measured after and before the interview and conversations. The task of enumeration was done by ten well-trained students from Addis Ababa University. The principal researcher led the discussions and coordinated the work of supervisor and the enumerators. The survey was undertaken during the summer of 1984. Data were analysed using the computer services of the Addis Ababa Master Plan Project Office.

The social factors considered in this study included literacy, marital status, family size, family income and expenses, distance covered carrying fuelwood, weight burden in relation to body weight, problems associated with the activity, and the working and living conditions of the women involved in the activity.

RESULTS AND DISCUSSION

THE CARRIERS

The exact number of fuelwood carriers in and around Addis Ababa is unknown. From this survey, it was estimated that there are about 73,400 carriers who cut or gather, transport and sell fuelwood, branches, leaves and bark to the city. Of these, about 90.8 per cent are women who transport fuelwoods on their backs. A reliable estimation of the population who live on this activity has been difficult because of the semi-legality of the job and seasonal fluctuation. The number of carriers goes down when forest product restriction is high and during the peak season in farming.

The amount of fuelwood supplied by this sub-population has not been estimated in the past. According to this survey, the fuelwood carriers in and around the city supplied a total of about 45,900 m^3 of fuelwood and 219,000 bundles of branches, leaves and bark during the survey month. This supplied approximately 35 per cent of the household wood fuel requirement of Addis Ababa. This is the first systematic study to estimate both the number of women involved in this work and the volume of fuelwood they supply to the city.

The majority (61.1 per cent) of these people migrated from rural and semirural areas to the city, to look for better lives most of them leaving their families behind. The rest come from low-income groups in Addis Ababa. Most are daughters and, in some cases, sons of fuelwood carriers. Although the migration of the rural underemployed to urban centers is a common phenomenon in most developing countries, the plight of this particular group of unemployed women and their role in fuelwood supply to the city has not been duly recognized. On the other hand, the contribution of these women fuelwood carriers towards the improper harvesting or destruction of the peri-urban eucalyptus forest has been unduly stressed.

Another area which has not been investigated is the impact of this work on health. Several respondents complained about a number of illnesses which they associated with their work. Nevertheless, most have continued to do this work regardless of its health and social hazards. They have been doing this for decades and in some cases for generations since some of the women are succeeded by their daughters.

As regards to literacy, 42.5 per cent of the carriers were found to be illiterate whereas 31.4 per cent had elementary school or above. As expected, literacy was higher among the younger generation.

Among the carriers, 37.7 per cent were married while the remainder were single, divorced or widowed. In addition, 66 per cent were heads of their respective households. They supported households ranging in size from 1 to 15 persons. However, the average household size was 5 persons. Women respondents indicated several factors for the disruption of the family, but most were directly or indirectly related to poverty.

Most of the carriers lived mainly by collecting, carrying and selling fuelwood, however to some the activity was a secondary source of income. Results indicate that 69.7 per cent of the carriers depended totally on the activity while the rest had other sources of income such as farming, 'tela'[1] selling, 'enjera'[2] baking, spinning cotton, etc. The average monthly income collected by a carrier from selling fuelwood was estimated to be Birr 35. Since the frequency of trips and the concentration of the activity varied (about U.S.$18) from individual to individual, the range of income obtained by carriers was found to be Birr 14 to Birr 98 during the survey month.

THE ACTIVITY

Fuelwood fetching is one of the most tedious jobs traditionally assigned to women in most African societies. Women start their tiring day early in the morning, travel long distances and spend half of the day gathering wood, twigs, leaves, bark, etc. and the rest of the day to travel back home.

In and around Addis Ababa, fuelwood carriers gather and carry fuelwood and other biomass for domestic fuel, from Gefersa area, Gojjam Road as far as Sululta, Entoto Mountain, Asmara Road as far as Legedadi, and Jimma Road. The fuelwood brought to the city from these different directions is sold at various points of supply. Though a large amount of fuelwood is sold on the way to the market, the major points of supply include open markets in Kolfe, Mesalemia, Merkato, Kechene, Shiromeda, Selassie, Agoza, Shola and Lideta. This study showed that fuelwood carriers travel with a heavy load on their backs from 0.5 to 34 kms. The average distance they travel carrying fuelwood is 11.8 kms. The study also revealed that individuals travel this distance with burdens of 1 to 77 kg. on their backs. The average weights of fuelwood and other plant products actually measured during the survey was 34.5 kg.

When this amount of weight burden was compared with the body weight of carriers, the results were alarming. Among the participants, 16.8 per cent were found to be carrying weights greater than their body weights. Some women were found to carry as much as 333 per cent of their body weights. Despite the physical toil of this activity, some respondents had stayed in the job for up to 40 years due to lack of alternative means to support their livelihood.

A significant proportion of their working hours is taken by the activity of fetching fuelwood. On the average carriers spend 7 hrs. a day engaged in fetching and transporting duties. They make 1-7 trips per week as well as shouldering additional responsibilities of child rearing, household work and other community activities. The multiplicity of the social and physical productive and reproductive roles of women in a traditional setting such as Ethiopia not only has not been properly analyzed but it has not even been appreciated.

ECONOMIC RETURNS

As indicated earlier, though an income of 35 Birr/month was estimated, it was difficult to accurately assess the true income picture from the activity. Since most of the carriers collect fuelwood and other forest products illegally, they were not willing to reveal their actual income. Therefore, to determine their monthly expenditure and estimate indirectly the income, it was attempted to get their monthly house rent and household expenditure, and savings through 'ekub'[3] and 'edir'[4]. As a result, on the average, the majority had expenditures of more than 100 Birr per month. Among them 46.1 per cent pay an average of 4 Birr per month for rent, 63.7 per cent spend an average of 10 Birr per month through 'ekub' and 67.3 per cent pay an average of B2/month for 'edir'. This imbalance was off-set by incomes generated from the activities of children. On the average, each household earns an income from 1.5 children engaged in the same activity. In addition, for most of these families living in deficit through borrowing and other means is not uncommon.

Carriers determine the price of the gathered wood, twigs, leaves and bark taking into account, demand, availability, hardship and their immediate need. The price of a bundle of fuelwood supplied by carriers varies from season, point of supply and the urgent financial need of the carrier. Carriers agree that the price of fuelwood has been increasing rapidly from year to year. The explanation given for this price increase is the scarcity of firewood supply from the peri-urban plantations and the restriction and additional charge levied on carriers by Peasant Associations (PAs). About 60 per cent of the respondents indicated that they paid 25 cents to 4 Birr to peasants when they leave the forest depending on the volume of the bundle and the type of the "phytomass"[5] they gathered. The price of a bundle, which is approximately 0.06 m^3, ranges from 1 to 6 Birr.

When sold by carriers, this amounts to 16 to 96 Birr per m^3. The average price of a bundle, however, is Birr 3.50 which is approximately equivalent to 53.33 B/m^3. Thus, the average monthly income generated from fuelwood sale was estimated to be Birr 35 per carrier. The range of income, however, was found to be Birr 14 to 98; this gives an approximate income range of Birr 168 to 1176 per annum per carrier.

Seasons have an important economic impact on the lives of the carriers. Fuelwood demand and consumption in the city during the rainy season is higher than in the dry season. Conversely, the supply rate in the rainy season is lower than in the dry season. The rainy season makes fuelwood gathering and transporting very difficult. Therefore, fuelwood carriers earn more money by supplying less fuelwood during the rainy season whereas during the dry season they need to carry and transport significantly more fuelwood to get the same or less income.

COMMON PROBLEM FACED BY CARRIERS

Women carriers face multiple problems while gathering and transporting the forest product to the city. Apart from the physical stress of their work, they run the risk of confiscation of the gathered phytomass by forest guards, peasants and others. They are also victims of rape, beating and health hazards. Due to malnutrition and the debilitating nature of the work, the large majority of the women in this activity complained about several types of illnesses.

Leaving home very early to avoid the risk of confiscation and to have more time to gather fuelwood is a day to day activity among the carriers. Some of the carriers have even started fetching and transporting fuelwood at night to avoid detection by the forest control parties.

About 56.2 per cent of the carriers complained about being chased away from the forest by peasants. In the process, women were beaten, raped, and lost their gathered fuelwood. Two per cent of the women carriers indicated that they suffered from rape while gathering fuelwood. About 42 per cent of this sub-population suffer from multiple problems of hunger, maltreatment and disease. A common problem repeatedly mentioned was frequent falls with a burden on the back resulting in bone fractures and other complications. Most of the participants suffer from pain due to heavy burdens and long trips. In addition, eye problems, headache, chest and back pain and other internal pains were also commonly mentioned.

More than 95 per cent of the carriers were in an unhealthy state and most suffered from poverty-caused illnesses. Most were severely malnourished. They reported that hunger was a daily phenomenon: in most cases they ate only one incomplete meal per day. They usually leave their homes without breakfast. After they complete their gathering duties they eat traditional snacks sold on the street by other women. These snacks include boiled or roasted cereals, namely, 'nefro' and 'kolo', and bread made from a mixture of different cereals.

The living condition of Ethiopian women in general has affected their biological and physical reproductivity. Twenty thousand women die of septic abortions every year. In 1984, maternal mortality was estimated to be 20 per 1000 deliveries (World Bank, 1984). Among the carriers surveyed, 23 per cent had had only one child while 31.6 per cent reported losing one or two children through infant or child mortality. More than 12 per cent had experienced miscarriages. The rate of miscarriage was more prevalent among 40-49 age group who carried relatively heavier weights, traveled longer distances and had stayed in the job longer. The average birth space among fuelwood-carriers was found to be 2.6 years.

Even though fuelwood carriers are directly involved in the destruction of the Addis peri-urban eucalyptus plantation, they expressed the views that the day to day dwindling forest situation threatens their survival. More than 50 per cent indicated that the phytomass material is getting scarce and so their incomes were suffering. They suggested that the existing plantations should be maintained properly to enhance their productivity and at the same time alternative means of employment should be created for them.

The creation of alternative means of employment is a crucial issue both in terms of releasing women carriers from tedious and unproductive work and saving the existing plantations from improper exploitation. When asked about the choice of work, 29 per cent of the carriers responded that they would like to work as daily labourers; 9.3 per cent wanted to go into farming, 13.3 per cent chose handicrafts and 48.3 per cent wished to be involved in activities such as weaving, working in factories, cow-herding, trading, spinning cotton, etc.

CONCLUSIONS AND RECOMMENDATIONS

With respect to the work done by fuelwood carriers, Addis Ababa or the Ethiopian government currently must address four important issues:

1) Exhaustion of the existing peri-urban plantations,

2) Fuelwood shortage in the city,

3) Lack of fuelwood supply system, and

4) Unemployment of fuelwood carriers.

This study has shown that the existing scarce and poorly managed eucalyptus plantations are misused and being exhausted. There is evidence of a lack of proper planning and implementation programmes to establish and sustain productive plantations to reliably supply the city with fuelwood. In addition, a centrally controlled fuelwood supply system is lacking. This has resulted in the improper exploitation of the existing plantations by fuelwood carriers and peasants. It has also caused the current fuelwood shortage in the city. On the other hand, a significant fraction of the urban and semi-urban population is faced with a predicament of unemployment and the necessity to engage in unproductive activity both towards the environment to earn a livelihood.

To alleviate these serious problems the following recommendations are made:

1) An urgent assessment of the capacity of the surrounding eucalyptus plantations must be undertaken.

2) A viable forest management system must be established, aimed at making the existing plantations more productive.

3) The forest control regulations need to be implemented to avoid or minimize malpractice in tree cuttings.

4) A systematically managed and centrally controlled supply system must be created. This will avoid unplanned cuttings and destruction of forests and help to maintain consistent supply and price levels.

5) The effort of well-planned replanting and the development of practical forest management procedures must be given priority in the long-term programme.

6) Last, but not least, if the above recommendations are put into effect, the large number of women living on collecting, carrying and selling of fuelwood must be given alternative means of employment to support themselves.

Implementation of the final recommendation will require the participation of different agencies and adequate funding. In addition to funding, it will require a strong organization and training component. In the short-term and intermediate period, this work force can be productively employed in the development of the peri-urban plantations and in the production of energy efficient local stoves. Specifically a project having three components is proposed. Part one of the project would involve the present fuelwood carriers in:

1) the maintenance and management of the existing peri-urban plantations to improve their productivity and reduce the rotation period,

2) the carrying put of practical training programmes and utilizing the female work force in the national and international peri-urban reforestation scheme,

3) the participation, after proper training, of these women in the development and maintenance of forest nurseries which would supply the replantation programme.

The second part of the proposed project would involve a training programme for women who are currently carrying fuelwood in the production of energy-efficient local stoves. This proposal could be implemented at the same time with part one of the project or may be considered as a follow-up activity. This suggestion assumes that the simple and efficient local stoves will be developed by various appropriate technology groups. After the development of the prototypes, the above mentioned group of women could play an important role in mass production using small local workshops.

The third part of the project would involve a study of women fuelwood carriers to identify and test interventions that would alleviate the problem of unemployment. The project would concentrate on the high level of participation of the selected group of women in identifying and testing interventions. The identified and tested intervention could be disseminated to voluntary national, international and non-governmental organizations for implementation.

To ensure the success of the proposed project it is recommended that it be attached with various development programmes and should involve the following agencies.

Agency	Suggested involvement/contribution
The World Bank	The Bank could include this programme for women in the existing Addis reforestation scheme. The Bank can assist both in planning, funding and implementation of the project.
International Development Research Centre (IDRC)	IDRC could play an important role in funding the above mentioned research project and assisting with the initial development of the interventions.

International Labour Organization (ILO)	ILO could facilitate/coordinate training and research for these women and implement projects in cooperation with the local agency.
World Food Programme (WFP)	WFP could help in providing food supplies to participant women in the project as an incentive until they became self-supporting individuals.
Food and Agriculture Organization (FAO)	FAO could make available a revolving fund to partially cover the project cost.
United Nations Children's Fund (UNICEF)	The involvement of UNICEF in the funding and training components of the project would be sought.
African Training and Research Center for Women (ATRCW)	The participation of ATRCW in making available supplemental fund and in the organizing and training of women would be essential.
United Nations Development Programme (UNDP) Non-governmental Organization	Could assist projects financially and materially as well as take initiative in carrying out development projects for these women.
Addis Ababa Master Plan Project Office (National Urban Planning Institute)	AMMPO or NUPI should be involved in the feasibility study and planning of projects for women.
Revolutionary Ethiopia Women's Associations (REWA), Community Forest and Soil Conservation Development Department (CFSCDD), Urban Dwellers Associations (UDA)	These organizations should help in mobilizing and organizing of the participating women.
Office of the National Committee for Central Planning (ONCCP)	Should be involved in the planning and coordination.

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FOOTNOTES

1. Tele is a Traditional home made beverage.

2. Enjera is a thin spongy pancake-like bread made from ground and fermented tef or a mixture of tef and other cereals.

3. Ekub is a traditional way of saving whereby groups of people agree to deposit an equal amount of money periodically and give to each member sequentially.

4. Edir is a community based on self-help association whereby members help each other during death and other emergencies through financial support and personal services.

5. Phytomas is used tomean wood, leaves, branches, barks stumps and plant residue.

6. Currency 1 Birr (B) = USD 0.48

7. Standard metric system

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RESEARCH NOTE: WOMEN, LAND AND LEGAL SYSTEMS

Fiona Mackenzie

Analysis of the agrarian crisis currently faced by African states south of the Sahara is hampered not only by the lack of meaningful data at all levels of aggregation but also by the lack of conceptual frameworks adequate to the task of probing the great diversity of agricultural systems. Addressing the latter lacuna, Berry (1984), in a review of the extensive literature on the food crisis and agrarian change in Africa, proposes that the debate may be moved forward through a focus on the changing rights of access to productive resources in the agricultural context, in addition to an analysis of changes in the allocation of such resources. She writes:

> People react to changes in technical possibilities, economic incentives, or legal codes and practices by seeking access to resources as well as by reallocating them. Strategies of access, in turn, shape the structure of economic and political relations within which agricultural production takes place, just as changes in the composition or methods of production affect economic performance. Yet people's struggles over access have frequently been overlooked both in theories of individual responses to economic condition and in structuralist paradigms of socioeconomic change (1984: 90).

Her argument, succinctly, is that agricultural productivity in Africa has been constrained through the investment of agricultural surplus in social relations, those of kinship or patronage ties which define access to productive resources, rather than in productive capital. But her discussion of social relations vis à vis access to and control over productive resources stops short of considering struggles within the household in this sphere.

Recognition of problems associated with conceptualizing the household as a 'monolithic decision-making unit' (1984: 84), of the greater empirical precision of distinguishing among units of production, consumption and accumulation within households, appears in Berry's consideration of 'Domestic Organization and the Relations of Agricultural Production' (1984: 82-85). The notion of women and men as actors in the struggle over access to and control over resources is not, however, integrated in her concluding discussion with the wider political economy. That it is necessary to do so in the search for explanation in the context of a deepening agricultural crisis is apparent from recent research which examines the link between access to resources of production and agricultural productivity (e.g. Dey 1982; Jones 1986; Carney 1988; Watts 1988).

The task of linking the 'domestic' with the broader political economy, whether local, national or international, is complex and well beyond the scope of this research note. My objective rather is to suggest that one point of departure for making this link is to focus the struggle within a framework of legal pluralism. This perspective is particularly pertinent where land tenure systems (see Manuh, this volume) are the subject of inquiry and where processual analysis which seeks to capture the iterative nature of the relationship between intrahousehold struggle and large-scale process is intended. (See Moore 1988).

Legal pluralism, to follow Merry (1982: 71), is found where 'alternative modes of resolving disputes...which are rooted in vastly different legal principles' coexist. Modes of dispute resolution constitute what Merry refers to as 'legal spheres', the latter being characterized by: a set of rules defined by 'custom' or laws enacted by political authority; accepted procedures in the process of resolving disputes; 'a political and economic context' from which the arbitrator derives authority to act; and, a structure of accessibility specifying economic, sex-linked, ethnic, and other requirements for access to the legal spheres' (ibid.). Merry suggests that individuals choose among the legal spheres according to the perceived relative costs and benefits of each sphere. In so doing, they modify the structure of the systems.

The legal spheres are, themselves, interactive and hierarchically ordered. Merry refers to their 'articulation' metaphorically as 'gears in a machine', noting that the exercise of law under the dominant sphere, in her argument, that dispensed by the state, is restricted in scope by its 'accessibility' (1982, 72).

Merry's conceptualization of dispute settlement and women's and men's struggle in a situation of legal pluralism in the Zambian copperbelt is important in indicating a means of analyzing the relationship between agency (actors' strategies) and structure (legal systems) and the domestic domain and the wider economy. But here treatment of 'customary law' as one legal sphere is ambiguous and consideration of gender struggle in the context of legal pluralism is largely unexplored in her area of case study. The problems inherent in her conceptualization of this legal sphere will be outlined below.

'Customary law' is defined by Merry as 'an amalgam of traditional laws, the values of brokers linking indigenous peoples and the colonial authorities, and European ideas' (1982, 74). Notwithstanding her arguments to the contrary at the beginning of the paper with respect to the dynamic nature of legal spheres, such law, in her analysis of the situation of the Zambian copperbelt, appears as frozen or fixed through the colonial project. Such a definition, while reductionist, does move in analytical terms beyond a view of custom as autonomous, ahistorical, the product of a 'self-contained particularity', to use a phrase of Fitzpatrick's (1988: 1). But it may be differentiated from a third view of 'customary law', one where such law is perceived as interactive with changes in productive mode (Fitzpatrick 1988: 4). 'Customary law' here becomes an arena of struggle, pliable and manipulable by individuals or groups, and subject to ongoing construction and reconstruction in the resolution of dispute. This last perspective, it is argued here, is particularly valuable in terms of elucidating the struggle in which women and men engage in terms of accessing rights in systems of land tenure, and in understanding the process by which social differentiation is legitimated.

The analytical potential of this perspective is evident in Glazier's (1985) study of land tenure among the Mbeere of Embu District, Kenya, even though this research is not gender sensitive. Except as subjects in bridewealth relations, women are rarely mentioned. Glazier's research was conducted between 1969 and 1979 when a system of freehold land tenure and the registration of individual parcels of land was introduced in Embu. In this situation of legal pluralism, the legal sphere of 'customary law' is portrayed in 'diachronic' terms (1985: 270), 'customary law' being a 'continuously evolving code' (1: 231) informing the strategies that individuals or groups adopt to realize claims to large tracts of land to be registered under the freehold system of tenure.

One strategy adopted by individual members of a clan or, more commonly, by amalgamations of agnates in a context of increasing land scarcity, concerns the manipulation of clan membership, as this institution under 'customary law' sanctions rights to land. Such groups may be members of a single descent unit or, Glazier contends, they may 'fabricate' tradition (1: 180), using the 'fiction of descent to define themselves in a customary idiom' (2: 190-191). In the latter case, matrilateral kin and non-agnates who have financially supported the group claim may be included as members (1: 272). Descent ideology, one element of customary law, thus becomes the instrument of social differentiation while at the same time masking 'the blatant maneuvers of self-seekers scrambling for land' through subscription to the 'bonds of brotherhood and the legitimating function of now lengthy genealogical pedigrees' (1: 281). While appearing to support the status quo, the creation of 'customary law in reality 'represents the very mechanism effecting social transformation' (1: 282).

Chanock's (1985) discussion of customary law 'masquerading' as something quintessentially African, 'an ideological screen of continuity (1: 4), contrasts with Glazer's study in locating gender relations at the pivotal point of the struggle played out in the wider political economy, but he similarly engages in a conceptualization of this legal sphere as a 'language of legitimation'. 'Customary law' in colonial Zambia and Malawi became, Chanock argues, an instrument used to defend elements of old relations, but it also served to define, and control, new relations created in the colonial context. Marriage laws, for example, were created through a process of 'retroactive fantasy' on the part of chiefs in collaboration with colonial authorities, in order to effect control over female labour and access to productive resources. The manipulation of marriage laws was viewed as critical, access to land, the main means of production, being defined through the social institution of marriage. Among matrilineages, with divorce, men forfeited their rights to land.

While illustrative of a view of customary law created in the process of interaction with productive mode, 'customary law' became, in Chanock's analysis, frozen in time to reflect a particular historical moment. In contrast, Watt's (1988) and Carney's (1988) research among the Mandinka in the Jahaly-Pacharr irrigation scheme of The Gambia portrays a situation where gender relations have become the 'fulcrum' of ideological and material struggle (Watts, 1988: 2) in a current struggle over the control of labour and land under conditions of contract farming. Here, 'customary law' defining the allocation of land among household members, and distinguishing between maruo, household land, and kamayango, individual land, has been manipulated by men in claiming rights to newly irrigated land. Reclassifying rice plots as maruo, rather than kamanyango, and thereby legitimating their control over female labour and its product, men have appropriated large surpluses 'in the guise of communal food production' (Watts 1988: 24). De facto control over the land has been achieved by men, despite the registration of the land in individual women's names in 1984. The latter had been achieved subsequent to the intervention of the International Fund for Agricultural Development the main donor. Men, with their 'culturally dominant' power to name, to evoke 'tradition', as Carney (1988: 341) notes enabled 'the compound head to make claims on women's unpaid labour when in fact the plot functions as his individual Kamanyango'. In this specific case, measured declines in productivity per hectare of irrigated land have been associated with women's withdrawal of their labour from the irrigated rice plots where resolutions of the conflict within the household over their labour and control over crops has meant the elimination of their 'customary' rights (Watts 1988: 26).

But women are able to act within the legal sphere of 'customary law' in their own right in other documented cases. In the context of Muranga'a District, Kenya, where I have conducted research among smallholding households (Mackenzie 1988), the analysis of oral agricultural histories has indicated how, in a situation of increasing land scarcity, both women and men have had recourse to 'customary' and statutory law in attempts to legitimate access to land. For example, individual men, through subscription to the idiom of clan territory, have been able to recreate elements of 'customary law', and gain access to land to which women, on the death of their husbands, may have freehold title. On the one hand, subclan, mbari, authority has declined with the increasing stratification of rural society, but on the other, where individual men have accessed land rights on the basis of a claim to subclan territory, subclan territorial authority has been created as an instrument of male solidarity, a powerful element in contemporary customary discourse. The ability to manipulate customary law is not, however, the sole prerogative of men. Although not common, women have been able to retain claims to land through customary idioms such as that of female husband, and as groups, through the modern medium of local collective organization, registered women's groups. (See also Stamp 1987). A minority of women have also been able to gain access to land on the basis of land purchase, operating within the legal sphere of statutory law, and in defiance of male claims of territoriality.

My point in drawing attention to these different conceptualizations of 'customary law' as a legal sphere, interacting in much of Africa with legal spheres defined by the state, or in the example of the irrigated swamps in The Gambia, with the project management with the tacit approval of the state, is to suggest a starting point for the analysis of women's and men's interests vis à vis the land, rights which, in situations of increasing land scarcity and commercialization of production, are frequently conflictive. The documentation of gender struggles with respect to access to the land is as yet an embryonic area of research, with the linkages between intrahousehold relations and the broader political economy only lightly sketched. That it is a fertile area for the development of new concepts and methods for elucidating this component of the agrarian crisis in Africa is evident from recent research in the area.

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WOMEN AND WATER RESOURCES MANAGEMENT IN AFRICA

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Large increases in population in African countries have led to a growing demand for water for domestic, agricultural and industrial purpose. Water which had been abundant for domestic use when the population was smaller, is now scarce. Rain which provided water for farming is now disappearing, resulting in drought and famine in some countries. This has led to a growing demand for water resources management which involves the development, allocation, utilization, control and treatment of water.

AFRICA'S CLIMATIC REGIONS

Africa contains one-fifth of the total land surface of the world, with an area of 30,100,000 square kilometers, a quarter of which is the world's largest desert, the Sahara Desert. In a much of Africa, annual rainfall is limited or inadequate for agricultural production.

There are eight general climatic regions. The hot desert region consists of the Sahara, the Kalahari and the Northern Kenya-Somali deserts. The average annual precipitation in these areas is below 100mm and the rains are rare and erratic. The semi-arid region is made up of the areas on the fringe of the deserts, with the largest part being the land south of the Zambesi River. The average annual precipitation range is 100 to 500. Average annual precipitation of 1,000mm characterizes the tropical wet and dry region, which is also referred to as "savanna". This area occupies about 50 per cent of the total surface of the continent. The rains here are seasonal, falling in the "summer", with the rest of the year being dry.

The equatorial tropical wet region occurs in the coastal areas of Guinea, Sierra Leone, Liberia, Nigeria and Cameroon. Average annual precipitation is above 2,000mm and there are two peaks of rainfall in the year. Rain falls only in the winter in the regions of Mediterranean climate, which are the Northern and Southern extremities of Africa. These periods are December to January in North Africa and June to July in South Africa. The summers, June to July in North Africa and December to January in South Africa, are hot and dry.

The south eastern coast of South Africa has the humid sub-tropical marine climate. Rain falls throughout the year, but is heavier in summer. There is usually more rainfall in the winter in the warm temperate climatic region which is restricted to the Highveld of Southern Africa. Finally, the high mountainous areas of Ethiopia and the lake region of East Africa form the mountain climatic region, where snow falls on the tops of the highest peaks, such as Kilimanjaro.

AVAILABLE WATER RESOURCES IN AFRICA

The combined annual flow of African rivers is only sever percent of the world's total river flow reaching the oceans. The largest rivers of the continent are the Nile, the Congo, the Zambesi and the Orange. The rivers in North Africa which originate in the Maghreb mountains are perennial. The Sahara Desert has numerous dry water courses, but they are very rarely filled with water. West Africa has many rivers flowing south into the Atlantic Ocean. The largest of these is the Niger which starts in the mountains of the Republic of Guinea and flows through Mali and Niger into Nigeria, where it is joined by the River Benue to flow into the Atlantic Ocean.

The world's longest river, the Nile, which is 6,650 km in length, rises from the mountains in Burundi. The Nile, which obtains most of its flow from the Ethiopian highlands, empties into the Mediterranean in Egypt. Its main tributaries are the Bahr-al-Ghazal on the left bank in the Sudan, and on the right bank, the Sobat, the Blue Nile and 'At-barah.

The Congo River, which is 4,700 km long, has two peak flows resulting from the rainy seasons in Northern and Southern Africa. Its main tributaries are the Ougangui and the Kasai. The Congo flows into the Atlantic through a swampy estuary. The Zambesi River is 3,540 km long. It flows through Zambia, Angola, Botswana, Namibia. and Zimbabwe and into the Indian Ocean in Mozambique. The Orange River, which is the longest river in South Africa, has its source in the eastern highlands. The Vaal from the north is its major tributary, and it flows into the Southern Atlantic Ocean.

Large and small natural inland lakes abound on the continent. Most remarkable are the several lakes of East Africa which occur in the Rift Valley, for example, Lakes Albert, Edward, Kivu, Tangayika, Rudolf, Nyasa, Rukwa, Natron, Manyara, Eyasi and Magadi. These lakes are usually very deep, with their floors below and their surfaces hundreds of metres above sea level. Some of them contain saline water. In contrast, the largest African lake, Lake Victoria, also in East Africa, is found on a plateau 1,134 metres above sea level with a maximum depth of only 82 metres.

The major groundwater reservoirs of Africa are found in the sedimentary areas in the centre of the Sahara, in the Libyan desert, in the Taoudeni-Niger Region, in Chad and the Congo Basin, in the Kalahari desert and the Karoo area of South Africa. Aquifers are absent in the East African plateau and in the area around the Cape in South Africa. Groundwater is also found in many other areas with different geologic formations. The chalky shales and dolomitic limestones overlying the basement rocks in Zambia and South Africa; the sandstone, limestone, sand and gravel sediments of the coastal areas of Senegal; Ivory Coast, Ghana, Togo, Benin, Nigeria, Cameroon, Gabon, the People's Republic of Congo, Angola, Mozambique, and East Africa; and the limestone of the Maghreb all contain aquifers with varying yields of water. In Egypt and Algeria artesian water is obtained from the Continental Intercalary which also extends to the Sudan.

WATER RESOURCES MANAGEMENT

Water is a vital resource for existence and this is demonstrated by the high population densities found in West Africa around the lower reaches of the Niger River, and between the Gambia and Congo Rivers; in Eastern Africa along the coast from Kenya to South Africa; the shores of Tunisia and western Morocco on the north coast; the Lower Nile area; the East African Plateau around the great lakes; and the Ethiopian Plateau. In each of these areas, population is concentrated along river valleys and beside available water sources.

This is reminiscent of several early civilizations -- and many large cities in industrialized countries -- which flourish along river valleys. The ancient Egyptian civilization depended on the Nile to provide water for all its needs. Nile water was used as the domestic water supply, while he Egyptians are reported to have refrained from draining used water back into the river. The Nile also provided water for the large irrigation schemes that were necessary for adequate food production. Today, the Nile still maintains its great importance to Egypt and the other countries through which it flows.

There are more than 50 African rivers which are shared by two or more countries. Mozambique, for example, has 12 international river basins including the Zambesi. The development of these water resources must be a cooperative endeavour. Although several international agencies have been established, a lot of problems still exist in the sharing of these water resources. Regional management of water resources has legal, social, economic, ecological and institutional aspects. Water is required for the domestic water supply, for agricultural use in irrigation and livestock breeding, for hydroelectric power stations, for fishing, recreation and navigation, and for industrial use. The available water resources in Africa had sufficed the population in precolonial times (which is defined here as the period before 1900). There was abundance of water in comparison to demand and the multi-purpose uses of water did not conflict. Today the situation with regard to water resource management in Africa is more complex.

PRECOLONIAL PERIOD

There are about 3,000 ethnic groups or tribes in the African continent. Some have similar cultures and traditions while others are distinctly different. This makes generalisation difficult. However, in the precolonial period, most Africans depended on small-scale farming centered on the family community. Crops grown were for subsistence. Surplus crops could be exchanged for other needs or given out as gifts.

Water was publicly owned, especially in areas of scarcity of water. Usually domestic water was collected from upstream while other water-related functions were carried out downstream. Refuse and waste were not allowed in the rivers. In areas with abundant water, water flowing through an individual's land could be used as if personally owned. In arid and semi-arid areas, however, irrigation was necessary to provide adequate food for the people as rainfall was irregular and insufficient.

Irrigation, which is simply the addition of water to land, now refers mainly to its application in agriculture for increased crop production. There is evidence that irrigation was used in ancient Egypt and Babylon in 5,000 B C and 2,200 B C respectively. The idea of irrigation probably spread along the trans-Saharan trade routes to the southern fringes of the Sahara. The practice was common in the Borno empire around Lake Chad and its rivers. There are still small-scale irrigation systems using the shaduf in North African countries and northern areas of West Africa.

The shaduf, which is a simple device for lifting water using the principle of the lever, is said to have originated in the Nile valley in Egypt. This method is labour intensive and was operated in ancient Egypt by slave labour. Its use is limited by shortage of land along river banks or by limits on available labour for the farm.

COLONIAL PERIOD

Colonization changed the nature of agriculture and social structure in Africa. Europe required large quantities of cash crops to be used as raw materials in its industries. Farming — with irrigation where necessary — was introduced in the colonies in Africa. The change to cash crop farming affected the functions of the members of the family and their responsibilities. Men commonly farmed cash crops, while others moved into hired labour in agriculture and mining. Women had to assume the position of farm manager and to provide for the children when the men were away. They also had to continue their original functions. In addition they now had to have separate plots of land to provide the crops needed for the family's subsistence. Women also adopted other forms of income generating activities such as trading, weaving and fishing.

Resources now belonged to the 'Government' or to particular people. One could not just start a farm on a piece of unused land. Individuation of land tenure, and legal recognition of men as "household heads" began to take place, thus reducing women's rights and access to land ownership. Women had to depend more on their husbands to provide land for subsistence farming and cash for other needs. They were still responsible for provision of water and fuel for the family's use.

POST COLONIAL PERIOD

Today, the economic development of the nations of Africa is dependent on self sufficiency in food production. This requires the development of agriculture, which in most areas can only occur with irrigation. Irrigation and large scale farming usually requires the extensive use of fertilizers and pesticides which invariably find their way into the water. Salts are also washed out of the soil during irrigation. These substances pollute the water as does the discharge of other industrial and domestic wastes into the water courses.

Water pollution apart from rendering the water unfit for drinking may cause other secondary problems such as invasion of fresh water courses with water weeds. Notable among the water weeds for its impediment to fishing and water transportation is the water hyacinth. This weed recently bloomed in the fresh water coastal system of Nigeria around Lagos and has been spreading to other coastal areas in the country and further inland. It is also found in the Republic of Benin and other West African countries have reported its expansion in their waterways.

Groundwater in its natural state is generally suitable for consumption without much treatment. In areas of drought and polluted surface water, Africans have exploited groundwater for drinking and sometimes irrigation. In the coastal areas of Nigeria, as probably in most other African coastal areas, groundwater has been overexploited for domestic and industrial water supplies. There is now arising the problem of salt water intrusion into the aquifers.

A different aspect of water resource management is the control of flood and land drainage. In some parts of Africa, especially in the large delta areas of rivers like the Niger, plans are being made to drain water from vast areas of swamp and flooded land for agricultural purposes. This may adversely affect the fisherfolk who depend on these areas for subsistence.

Today, African countries are also building industries which require water for cooling and other processes and which need large amounts of electricity. Large scale plans have been made for adequate water storage and distribution. Water is also being harnessed for hydroelectricity generation and other industrial uses.

The construction of dams for storage of water is widespread in Africa. In some cases the reservoir water is for multi-purpose use. The Aswan High Dam on the Nile, the Kainji on the Niger, the Akosombo on the Volta, and the Kariba on the Zambesi are some examples. While the communities displaced by dam construction are usually compensated for the land acquired by the Government, other problems are often created. Two Nigerian dams and the problems they created will be used to illustrate. They are the Kainji Dam and the Jebba Dam, both on the River Niger.

Although planned for multi-purpose use, these dams are primarily used for hydro-electric generation.

The Kainji dam was completed and the reservoir filled in 1968. forty-four thousand fisherfolk and farmers were displaced from 241 settlements and resettled in 141 new communities. About 30,000 acres of farm land of rich alluvial soil in the river basin were submerged. The Jebba dam submerged 2,347 acres of farmland affecting some 1,118 adult men and also submerging the clay material used for pot making by the women in the area.

On formation of the lake, large catches of fish were made, but these have been drastically reduced. The lake is also being lowered due to shortage of rainfall in its catchment area and damming of the river upstream. Communities downstream of the dams were also affected. The river water downstream was reduced leaving large areas exposed during low water periods. The fisherfolk suffered and rice farms were lost. Around 20,000 Nupe families who were traditional fisherfolk and farmers on the 'Fadama' were disturbed downstream of the Kainji dam.

Although the Jebba dam was not expected to cause any problems for communities downstream, it has reduced the volume of water in the river. Flood ponds have dried up. The Bacita Sugar Company that relied on the river's water for production activities has been adversely affected. Rice farms in the area which depended on flooding of the river banks have disappeared.

The creation of the new towns for the 'experts' working in the hydroelectric power stations attracted the settlement of traders, artisans and government workers around New Bussa and Jebba. Urban fringe communities with inadequate housing, water supply and sanitation facilities and other necessary infrastructure, have developed. Land excavated for sand and gravel to build the dam has been left derelict with large pits. These lands, which might have been fertile agricultural areas, have been turned in sterile empty zones. The pits may be turned into waste disposal areas and thereby become environmental and health hazards.

WOMEN AND WATER RESOURCE MANAGEMENT

When dams are constructed women in the displaced communities may have the following problems: locating a new source for drinking and domestic water supply, particularly if the river provided these before and inadequate provision is made for water supply in the resettlement areas; finding suitable fertile land for subsistence farming — the land in the resettlement may not be fertile or land for this purpose may have been omitted in the resettlement plans; where men have emigrated due to submerged land, women become "household heads" but have no land rights. They cannot purchase land for farming from the large irrigation farms and may have no other means of providing for the family; women who fished in smaller rivers may find their equipment inadequate for fishing on large dam reservoirs; finally, such women may face loss of orchards for fruit gathering and raw materials, such as clay for pot making.

Women downstream of the dam may face the above problems but will also be more adversely affected by the unavailability of water. Women in the areas of irrigated farms may be forced to use water in the irrigation channels, and that downstream of the irrigation schemes, for drinking and other domestic uses without realising the dangers of its contamination by pesticides, fertilizers and salts washed out of the soil. This is also a problem for women who depend on water courses that are polluted by industrial and domestic waste. Women in riverine areas with water hyacinth covering the water ways cannot move out or fish. Do they still use the river water for domestic supplies or what do they do? The freshwater from the well in the coastal area, suddenly turns to salt water! What can she do? Wait for the government to rescue her or continue drinking salt water? In areas of flood control, what do women do or what will they do when they find their ponds and streams which supply water for drinking and other domestic chores drained away for farms?

CONCLUSION AND RECOMMENDATION

There is very little information available on women's problems resulting from the development of large scale irrigation projects and the ways in which women are coping. Research in this field would provide a basis for focusing attention on women's needs in this area and for formulating policies that could be adopted to meet them.

There are two examples of African women's participation in water resource management and development which illustrate their cooperation and communal interests. The Basse Casamance of Southern Senegal had wells providing domestic water supply which were about 12 to 17 metres deep. They grew wet rice and millet for main staple foods, and peanuts, garden produce and livestock were cash crops. The women usually did all the work in the rice farms from transplanting to harvest while the men raised cattle and cleared or tilled the land. Most of the cultivation was during the wet season using rain water and the Casamance River. During the dry season and the drought period of the 1970's, most of the youth, male and female, migrated to find jobs in other regions and in the cities.

To deal with their problems, the women formed garden groups and exploited the abundant groundwater to irrigate their gardens. The gardens could be collective, or the marketing of produce from individual farms might be collective. Each member donated towards the establishment of the farm and later the group funds were used for community development programmes. National and international agencies like UNICEF assisted the groups by building and lining the wells and providing gardening tools, equipment and occasionally, pumps. The Women's Garden groups, as they are called, have now been replicated in many other villages in the region.

The second example is the Mossi Women's Dam in Burkina Fasso. Yatenga Plateau was known to have great potential for irrigated agriculture, cotton and grain production. The region was prosperous in the pre-colonial period but things changed, and there was high infant mortality, chronic malnutrition and very low or no per capita income.

Water scarcity has been a real problem in this arid region. Rains are irregular and percolate into the ground immediately. The groundwater table is also very low. The Government built some large concrete dams in the area but these were not sufficient for the entire region.

The Mossi women in this area were responsible for subsistence production but traditionally had no input in community affairs and decisions. The women in the village of Saye — in a local non-governmental organisation, the Naam group — gave the men, who had talked for years about building a small earthen dam to store the rainfall, an ultimatum. If the men did not build the dam the women would either build the dam themselves, or one or two would return to their original villages. This worked and the men and women built the dam together in 1981. They planted trees around the reservoir edges. The tree leaves were used for food and medicine. The reservoir raised the groundwater level in the environment. This allowed for the digging of wells of about 20 metres which would provide water for irrigation and domestic purposes. The project of dam building through the Naam groups has spread to other villages in the area and life is improving. Research with and for women's groups such as these will allow better response to women's needs in water resource management for the future of African communities.

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IMPACT OF ENVIRONMENTAL DEGRADATION ON CROP VARIETIES, FOOD PROCESSING AND UTILIZATION IN AFRICA

Florence E. Dovlo

African research institutions focussing on the development and utilization of food crop varieties are directing their attention to the problems of increased food production and to the processing and preservation of food crops to achieve self sufficiency. Satisfactory achievements have been made in terms of increases in crop yields, but due consideration has yet to be given to the suitability of the new high yielding crops for dietary uses.

African women like others throughout the world, have developed recipes for the utilization of traditional crops, and quality characteristics have been established for the various products. Any deviation from the known qualities of taste, texture and flavour renders the product unacceptable, particularly amidst multiple choices. It is therefore important to screen any new crop variety for its cooking qualities and for other factors that influence consumer acceptability.

Most of the crops grown in Africa, are prepared or processed by women into consumable food products with standard qualities for dietary uses. For example, maize (Zea mays) an essential staple food in most African countries, is prepared in a great variety of ways. In Ghana maize is utilized in almost every meal. It is cooked and served as light pap for morning meals and it is also made into thick food products that range from highly fermented whole meal products to very refined but lightly fermented ones served for noon and evening meals. These various maize products each have distinct characteristic taste, texture and flavour.

A popular maize product known as 'Kenkey' (boiled fermented corn dough) is used in this paper as a reference maize product. Kenkey making involves the processes of soaking the whole maize grains for at least 24 hours, then grinding to make a dough which is left to ferment for two to three days. During this period, the dough develops lactic acid which produces the desired sour taste and flavour and also enhances nutrients such as Vitamin B. Half of the fermented dough is cooked into a thick porridge and mixed with the remaining raw dough. The mixture is formed into balls, wrapped in corn sheaths and boiled. Kenkey has an inviting aroma and is enjoyed by many for its sour taste and sticky characteristics.

In an effort to step up food production in Africa, national research priority is given to major food crops such as maize, cowpea, cassava and oilpalm. Ghana's Crop Research Institute is undertaking research into these and other crops with the aim of increasing yield by identifying constraints that limit increased production and developing improved seeds with higher yielding and better germinating properties. A grains development project on maize has produced improved seeds that are high yielding. These seeds have been introduced to farmers who appreciate their high yielding qualities. However, public opinion has turned against their poor storage and cooking qualities which in turn adversely affect market prices. Traders prefer to buy local maize even if they have to pay more for it, because local maize is better suited for the stated characteristics that are desired for kenkey. The improved variety produces kenkey of unacceptable flaky texture. Research is therefore presently going on to develop alternative methods to make kenkey using the new high yielding maize variety but meeting the traditional qualities preferred for this product. Another maize product 'Abolo' (steamed maize paste) has characteristics that are more difficult to satisfy using the improved maize. This product requires a special type of local maize to obtain the spongy texture which is its standard quality.

Under the same project, and working closely with the International Institute for Agriculture (IITA) based in Ibadan, Nigeria, many cowpea varieties of high yielding, early maturing and pest resistant characteristics, suitable for Ghana's environment, have been identified and subjected to 'on farm' experimentation. In these trials, emphasis is placed on early maturation, high yields, pest resistance etc. Factors such as functional properties and consumer acceptability are not given the necessary attention.

Cowpeas, commonly referred to as 'beans', are the most popular grain legumes in Africa. Their economic value has long been recognised as a subsidiary crop to be relied on during the 'hungry' seasons. The high protein content of cowpea, makes it an important nutritional booster to the low protein diets largely consumed in Africa.

Despite its nutritional and economic attributes, cowpea often is given less prominence in the farmers' programme because of its poor yield and high susceptibility to insect infestation. Nevertheless, consumers typically have a choice of cowpea types of varying colours, size and other characteristics from which to select. Recipes for the utilization of cowpea are many and varied, and others are being developed by home economists to promote its increased consumption. Popular cowpea dishes include boiled whole cowpea, served with fried oil and 'gari' (a gelatinised cassava product), combinations of rice and cowpea known in Ghana as 'warkye', various preparations of cowpea stews and soups; and cowpea snack foods called 'akla' (fried cowpea paste) and 'moimoi' or 'tubani' (steamed cowpea paste).

The Food Utilization and Consumer Studies Division of the Food Research Institute of Ghana, has conducted a survey in two major cowpea producing regions of the country to determine the relative popularity of cowpeas in the diet of Ghanaians and the characteristics that are considered important in the choice of cowpea type for dietary uses.

Respondents were asked about choices and preferences with respect to 13 different varieties of cowpeas, all collected from local markets. The survey results indicate that consumers select cowpea on basis of colour appeal, cooking time, taste, swelling capacity, binding quality, ease of dehulling and its suitability for intended uses. Brown and red coloured cowpea varieties are preferred for dishes involving combinations with white cereals such as rice or maize to prevent monotony in the colour of the dish. For processed foods such as 'akla' (fried cowpea paste), and moimoi or tubani (steamed cowpea paste), the grains are dehulled to achieve good whipping and rising capacity, necessary for the spongy quality desired for these products. In this regard, ease of dehullng is an important factor.

Of the samples presented, the cream black eyed variety (coded as LV09) scores highest for quick cooking, good taste, swelling capacity, binding quality and particularly for its ease of dehulling. However, it is disliked for its heavy insect infestation and is considered inappropriate for combinations with white cereals as it produces a dish of a monotonous colour. Nevertheless, because of its other qualities, it is widely used especially in commercial scale production of cowpea dishes that require the brown type cowpea for colour appeal. In such cases the desired colour is effected by boiling the grains in an infusion of red coloured edible leaf known in Ghana as 'Karannefi' (Dagomba).

The red and brown types (coded LV03, LV05, and LV12) are preferred for their colour and textural characteristics, but these take longer to cook. In cases where the brown varieties must be used for their attractive colour, their quick cooking and binding qualities are enhanced by addition of mineral salt, known locally as 'Kawa' or 'Kawe', or salt peter (mineral sodium nitrate).

The survey also revealed that whole cowpea dishes are more frequently prepared for household uses than processed ones such as Akla, moimoi or Tubani, due to the labour involved in manually dehulling the grains in the preparation of these foods.

The problems of traditional cowpea dehulling are addressed in an applied research programme at the Food Research Institute in Accra. It's objective is to produce mechanically dehulled cowpea flour with good storage qualities for household and commercial uses. The researchers began by studying traditional methods of preparing cowpea flour and samples of flour produced by local processors were analysed for their physical and functional properties.

It has been noted that the cream black eyed cowpea variety is commonly used by women to make flour because its physical characteristics are ideal for easy manual dehulling after brief soaking. The flour that is produced also has functional properties of high whipping capacity and foam stability which are desired for making a favourite cowpea snack food known in Ghana as 'Akla' (Fried cowpea paste).

The production of the mechanically dehulled cowpea flour is directed to utilizing a new high yielding cowpea variety whose dark brown colour has no consumer appeal.

In traditional cowpea processing into flour, the grains are soaked and manually rubbed off to remove the skin coat. The dehulled grains are dried in the sun and then ground into flour. The disadvantage of this method lies in its intensive labour, and weather changes which cause the grains to become mouldy if not thoroughly dried. By using a dehulling machine provided by the International Development Research Centre (IDRC) of Canada, the cowpea grains are dehulled dry, without previous soaking. The challenge has been to produce cowpea flour with good keeping quality and physical characteristics and functional properties comparable to traditionally processed ones. Many years of comparative studies and analysis of the physical and functional properties of the new product, led by a home economist at the Food Research Institute, has achieved the stated objective of developing an unacceptable cowpea flour using a new high yielding cowpea variety which is rejected whole for household uses because of its unattractive colour.

Cassava (manihot sp.) is another important staple food in the region. Its dietary utilization can include simple boiling of the root and serving with stew or sauce or pounding the boiled pieces into a sticky mass known in Ghana as 'Fufu'.

The root may be processed into flour or grated into dough which may be used separately or in combination with maize dough or flour to make a thick porridge which is served with meat or fish soups. After grating, the mash may also be processed into a commercial product known as 'Gari' (gelatinized cassava product) which is used in preparing a variety of nourishing dishes. Before the introduction of cassava graters, women manually grated the root. They leave the mash in bags placed under heavy stones for two to three days to dry to a moisture level which the women determine by the sense of touch, as being suitable for making this product. The partly dried dough is then sifted and dry roasted into gelatinized grains that can be kept for months.

Different types of cassava roots are utilized for the various products described. For simple boiling or pounding into 'Fufu', the low yielding sweet variety is used. For processing into 'Gari', the big tubered, high yielding variety is used. This type of cassava, though high yielding, contains hydrocyanic acid which is injurious to health.

The traditional practice of allowing the grated mash to drain and ferment for two to three days, allowed much of this toxic substance to drain off. With the introduction of cassava presses, which speed the drying process, there has resulted a high level of hydrocyanic acid content in 'gari' produced using the new technology.

The extensive production of this type of cassava because of its high yielding quality, poses a danger to the health of consumers who may unknowingly utilize it for household food preparations. Women processors of 'gari' therefore must be educated to continue to allow the cassava mash to ferment sufficiently before using the new technology to press out the liquid. It is worth noting, however, that for certain dishes, moderately sour gari is preferred to a highly acidic variety. It is therefore important for home economics researchers to determine the right level of acidity preferred for gari by housewives for different food preparations, and to also eliminate the toxic substance.

Further examples of high yielding crops with poor cooking qualities and taste, could be cited. The high yielding oil palm fruit currently being produced in many African countries with its huge bunches and high oil content for commercial oil processing, is unsuitable for soups for which palm fruits also constitute an important ingredient. Moreover, oil that produced from these high yielding palm fruits is markedly different in quality and taste from traditionally processed palm oil.

It is therefore necessary for plant breeders and agronomists to renew research on traditional food crops and on unexploited indigenous crops which are fast becoming extinct. It may be advisable after the initial research by crop scientists to entrust to women farmers, the production of these traditional crops. In conclusion, it is well to emphasise that it is imperative that crop production must keep pace with Africa's population growth if the continent is not to starve.

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WOMEN, NATURAL RESOURCE MANAGEMENT AND HOUSEHOLD FOOD SECURITY: AN OVERVIEW

Ruvimbo Chimedza

INTRODUCTION

Women's participation in natural resource management is generally underestimated. This is mainly because participation in natural resource management is traditionally conceptualized in terms of regarding task performance of such activities such as wildlife ranging, afforestation, and soil conservation as national targets within institutional settings. The link between household food security and natural resource management, particularly that aspect of it relating to agricultural production, is often not clearly pronounced. Much of the debate on the issue has failed to recognize that agricultural food production processes are an important element of natural resource management. Yet a close examination of these processes clearly demonstrates that farmers' role as managers of natural resources is for the purpose of ensuring household and national food security. They are involved in soil conservation, wildlife, plant life and water management. In short, they are involved in the management of the basic natural resources as defined by the four ecosystems: water, soils, plants and wildlife.

Available literature has shown that African women play a key role in subsistence food production. (Boserup, 1970). The issue of household food security is central in the lives of African women. If this is so, the important question to ask is: "What is it that women do in subsistence food production that affects the environment i.e. natural resources?"

In attempting to answer this question, one finds that the agricultural production processes in which women are engaged, involve the management of renewable natural resources, with the primary objective of ensuring household food security. It therefore follows that women's perception of the environment and its management is dependent on its impact on household food security. For instance, if people depend on crop, animal production, wildlife or plant life for their food and income, their perception of problems will be influenced by how the production and gathering processes are affected. Women may be aware of some practices which affect the environment negatively, and ultimately have an adverse effect on their source of livelihood. However, they continue with such practices because this is the only way they can ensure household food security, or a continuous supply of food for household consumption. Frequently they find themselves in a dilemma whereby, to ensure desirable levels of productivity, they have to destroy another source of food or the environment on which their livelihood is dependent. Women are thus faced with making choices on a day to day basis, within the constraints of limited resources.

These contradictions confront women in a way which creates serious problems for themselves and policymakers. However, it is important to note that, there are two basic differences in the way policymakers and women perceive these problems. These will be discussed below.

The purpose of this paper is to provide an overview of the extent and nature of women's involvement in natural resource management. It will attempt to highlight the important linkages between women's natural resource management and household food security. It further brings to the surface contradictory processes that arise in women's attempts to ensure a continuous supply of food for household consumption. In general, the paper provides, in a descriptive manner, an overview of the problems facing women in their natural resource management activities. It is intended as a background for more detailed investigation into specific problem areas relating to women and natural resource management.

BACKGROUND

The question of household food security encompasses a broad spectrum of issues relating to women and natural resource management. Women are involved in the management of basic renewable resources in the production, gathering, processing and preparation of food. In fact, women's food and non-food related household responsibilities involve, on a day to day basis, the management of water, plants, soils and wildlife. These are the four basic "ecosystems" concept which emphasizes the interrelationships and dependencies in the use of basic natural resources. The ecosystem concept emphasizes the need to recognize the interrelatedness of all resource domains, in conceptualizing the way in which women relate to their environment. This recognition is of particular relevance to rural African women because, in the absence of specialization in the provision of services, they manage the basic renewable resources, for different purposes, in an integrated manner. Although this paper focuses on women's natural resource management activities, aimed at satisfying household food requirements, it is desirable to briefly allude to other natural resource management activities that do not directly satisfy household needs. Women also engage in management activities relating to the construction of roads, water reservoirs, public building, rural afforestation and national soil conservation programmes. These are generally community based natural resource management activities. This paper discusses such activities because it is imperative that, with respect to African women, both household and community-based activities be viewed as an integrated process. An examination of these activities will clearly demonstrate this point despite apparent contradictions in some of the processes.

The methodology of this paper is to examine management activities related to a particular resource individually. This allows an in-depth consideration of the management of each basic resource. Each activity will be viewed in terms of its impact or contribution towards household food security. The focus will be on problems associated with the supply of food for household consumption. Reference will also be made to some of the processing and preparation activities that have an impact upon basic renewable natural resources. The emphasis throughout the paper is on problems facing women in managing natural resources for the purpose of ensuring household food security.

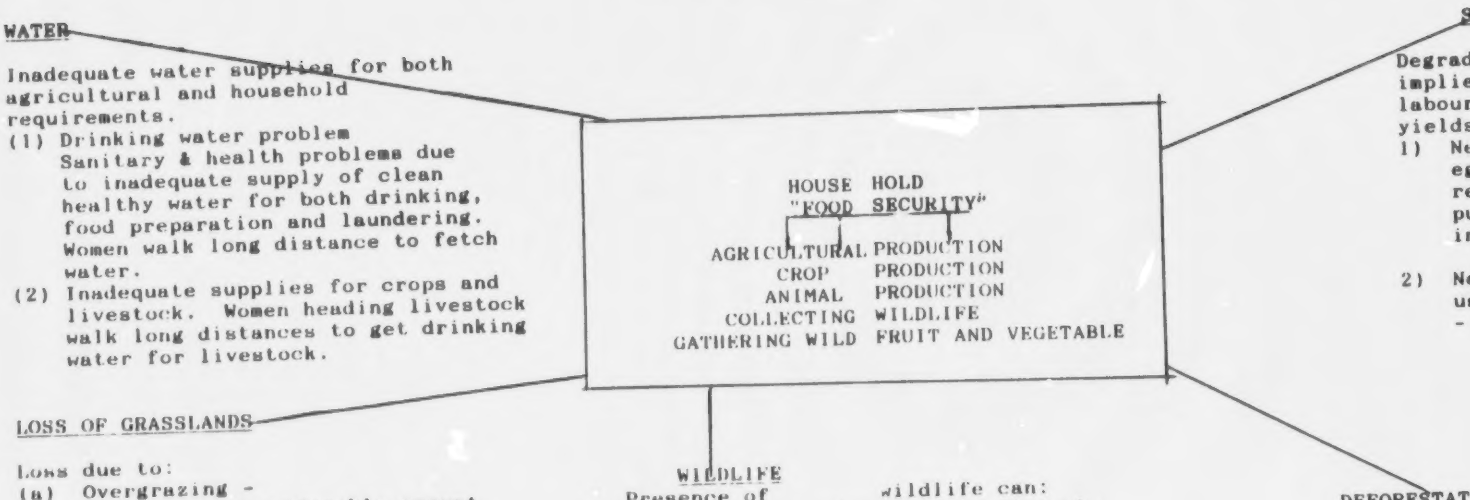
WOMEN'S RESOURCE MANAGEMENT ACTIVITIES

To answer the key question previously posed, i.e. "What is it that women do in their pursuit for household food security, which affects the environment?" - we refer to the chart below, which gives a summary of the management activities in which women are engaged. Note that the chart clearly demonstrates women's involvement in the management of all basic natural resources including namely water, soils, plants and wildlife. The chart, however, does not tell the nature of the actual relationship between these resources and those women who manage them. In other words, the chart addresses the question of the functional relationship but does not bring out the question of entitlement. Women are shown as producers and gatherers of food but their relationship to the basic resources or the means of production is not made clear.

It is not intended here to engage in an in-depth discussion of the question of entitlement to land, but it is important to underscore the centrality of entitlement to the problems of natural resource management. Entitlement determines the way in which women relate to their means of production. The ease with which women can access resources and the amount of control they can exercise over them can improve or undermine the efficiency with which they are able to utilize them. For example, it has been argued that women's lack of access to and control over resources such as land has negative implications for agricultural production. Without access and control over the basic resource, land, access to other resources found on land is limited. In terms of agricultural production, this means that influence over production decisions is reduced. In addition, entitlement or lack of it determines the ease of access to other support services such as credit facilities etc.

In most of Africa, crop production constitutes the major source of food for the rural population. This activity is frequently combined with livestock production which, as a source of food, is secondary to

CONCEPTUALIZATION OF WOMEN IN RELATION TO THE ENVIRONMENT NATURAL RESOURCE MANAGEMENT



HOUSE HOLD
"FOOD SECURITY"

AGRICULTURAL PRODUCTION
CROP PRODUCTION
ANIMAL PRODUCTION
COLLECTING WILDLIFE
GATHERING WILD FRUIT AND VEGETABLE

WATER

Inadequate water supplies for both agricultural and household requirements.

(1) Drinking water problem
Sanitary & health problems due to inadequate supply of clean healthy water for both drinking, food preparation and laundering. Women walk long distance to fetch water.

(2) Inadequate supplies for crops and livestock. Women heading livestock walk long distances to get drinking water for livestock.

LOSS OF GRASSLANDS

Loss due to:

(a) Overgrazing -
Women do a considerable amount of cattle herding while children

are at school.

(b) Human settlement;
households settled in marginal lands animal/human populations competing

WILDLIFE

Presence of wildlife can:

(a) bring economic benefits through tourism and hunting.

(b) Improve house hold nutritional status - wildlife as source of proteins.

(c) However, can hamper agricultural development. Women spend a lot of time trying to keep animals from destroying their crops.

SOIL EROSION

Degradation of soi implies more intensiv labour input for reduce yields.

1) Need to apply inputs eg. fertilizers - require money to purchase these inputs.

2) Need knowledge for use of these inputs - extension

DEFORESTATION OF NATURAL WOODLAND

Women have to walk long distances to fetch fuelwood and construction wood. - Consequences - agricultura activities may suffer - othe household activities are mad difficult. Food preparatio not done properly. People' health affected.

crop production except among a few ethnic groups such as the Maasai in East Africa and some nomadic groups in the Sudan.

Another important source of food that has been neglected in official statistics is wildlife and wild plant life. Wild vegetables, fruits, insects and animals constitute a very important part of the diet of most rural African households.

Crop production, depends to a large extent, on availability of water, i.e. moisture levels. In Africa, there is little substitute for this resource. Yet its availability is primarily due to nature. For those women engaged in crop production, management of water entails their adjustment to existing conditions. Their crop management activities are determined by when and how much rain comes. Even their production decisions are influenced by how much rain is falling. There is little that women can do to manipulate this resource.

In many parts of Africa, women are ill-equipped to deal with such adverse situations which threaten household food security. During periods of inadequate rainfall, most households experience difficulties because women have not devised effective strategies for coping with droughts. Irrigation facilities are limited. This problem is further exacerbated by the question of entitlement. Although water in most rural areas, is regarded as an open access resource to be utilized by all dwellers, it is not always easily accessible for crop production. The individual who occupies land on which water is located often restricts access by others.

In the absence of irrigation facilities, major crops suffer from lack of moisture during periods of drought. Women are not even able to benefit much from the small gardens that are normally maintained through the use of portable water from rivers. In Zimbabwe, for instance, a significant proportion of women cultivate small gardens near water points. They use cans or buckets to water these gardens and, in some cases, small irrigation canals are constructed to feed into them. During the dry seasons, vegetables are the major crops produced. When there is a drought, most water points dry-out so that production more or less stops, which means that this source of food is eliminated.

Water management activities in these gardens involves a certain amount of skill. The construction of small-scale irrigation canals requires knowledge about the direction of water flow, the appropriate depth of canal which allows water to flow with ease, techniques for cutting off and releasing water and ensuring a relatively even spread. For some these skills are acquired through extension education, but for others it is through their own efforts and experiences. They are coping strategies developed out of need.

Women's water management activities in crop production are an area in which government's increased involvement is desirable. For crop production it is not practical to expect every farmer to construct his or her own irrigation facilities. It is more logical for the government to provide facilities for groups of farmers so that they create economies of scale.

With respect to water, women's management activities are not only confined to those relating to crop production. Provision of water for household use is another important responsibility of women. This water is used in the processing and preparation of food as well as for other domestic purposes.

Management activities associated with potable water place a burden on rural African women, particularly during periods of little or no rain. It is common knowledge that the greater part of rural Africa is not serviced with purified piped water. Only a small proportion of the rural communities are serviced with communal bore holes and wells. The majority of the population depends on water from rivers, dams and natural wells for potable water. For many households, these water points are not easily accessible and during the dry periods women often have to walk long distances to fetch water. In some cases, they walk up to five kilometers to fetch a five - gallon bucket of water which then they carry on their heads.

These trips to and from the water points take up a lot of time because the collection of water is often combined with other related activities. This is a good example of women's integrated approach to natural resource management. When they go to the river to fetch water, they take the opportunity to do their laundry, take their baths, water their small gardens and sometimes gather vegetables. The water for these different purposes comes from the same source and it is managed in such a way that women try, within their constraints, to satisfy their different needs in the best way possible. For example, although their bathing and laundry are done in the same river that provides water for drinking and cooking they try to ensure that the water they carry back home is fit for human consumption. Sometimes, women are not able to provide their families with the cleanest water because of time and resource constraints. In some dry areas, water is so scarce that people, livestock and wildlife obtain it from the same source. In this case it becomes very difficult for women to ensure that they get clean water.

Management activities associated with potable water, in such cases, create a variety of problems arising from conflicting interests. On the one hand, it is in women's interest that livestock have access to drinking water, while on the other, having to compete for these resources places a burden on women who have to ensure a continuous supply of safe drinking water and food. The livestock and wildlife that threaten the availability of water are an important source of protein and draught power and therefore contribute towards household food security. Thus, in water management activities, women are faced with a number of contradictions which may impact negatively on household food security and health.

Another area of concern with respect to women's natural resource management activities in agricultural production is soil degradation. Global awareness of the problem has reached high levels, yet most of the suggested remedies do not pay adequate attention to women who till the land. African women's management activities, associated with soils, present special problems partly because most subsistence food production is carried out on marginal lands where soil fertility levels continue to deteriorate. In such cases, there is a pressing need for access to new improved technologies which restore soil fertility to levels that ensure greater productivity to allow for adequate supplies of food. Unfortunately, women's access to such technologies is limited by a number of factors.

First, many women lack easy access to extension service and credit facilities which would allow them to acquire and utilize fertility restoring technologies such as fertilizers. This is mainly due to the absence of women's entitlement with respect to land. Second, some of women's soil management problems result from lack of time and adequate labour to carry out soil restoration tasks. This may include tasks such as carrying and spreading livestock manure throughout their fields, or constructing contours to check soil erosion. With little access to technologies which might lighten these tasks, women find them laborious and time consuming.

Traditionally, in many parts of Africa, the problem of soil degradation was dealt with in a different manner. The slash and burn system was favoured, whereby, as soon as the soil had lost its fertility, land was abandoned and new land cleared. This method has been criticised by many who have not realized that the ash from burning raised the potash level in the soil and the abandoned land got a chance to regain some of its fertility through natural processes. Of course, this practice is no longer possible because of scarcity of land and the current systems of entitlement, which restrict the application of some of these indigenous coping strategies or techniques that ensured household food security. The same is true of the practice by nomads, who kept their animals on the move, permitting selective grazing, but usually not allowing a heavy concentration of animals in any one place. However, there may be other indigenous coping strategies which are appropriate for existing conditions. These need to be researched and promoted where appropriate.

WILDLIFE AS A HOUSEHOLD FOOD RESOURCE

Historically, household food security in Africa was not entirely dependent on agricultural production and domestication of wildlife and plants. People also relied on resources that were wild. Even today many rural African households continue to depend on wildlife resources for a significant proportion of their protein supplies. In Zimbabwe, where most rural households have limited access to meat and other common sources of protein such as milk, eggs, and fish, wildlife resources make an important contribution toward household food security. Women who have primary responsibility for gathering these resources and some of the gathering processes are closely linked to agricultural food production.

Generally, wildlife is viewed as an important natural resource with economic, cultural and ecological implications. They sustain a particular ecological system in which there are functional processes which help maintain essential life support systems such as soil regeneration and protection, and recycling of nutrients. The cultural value of wildlife species is significant in the performance of rites, which perpetuate certain traditions and cultures. In the process, traditional diets are perpetuated and this in turn contributes towards household food security by encouraging people to continue drawing from their traditional sources of food.

The economic aspect of wildlife is of great importance as a national issue in an institutional setting. Wildlife is a source of revenue, particularly foreign exchange, for a number of African governments. For example in Tanzania, there is always a flow of tourists coming to view wildlife. The same applies to Kenya, Zimbabwe, Malawi, etc. Animals such as giraffes, elephants, buck, duiker and zebra, attract tourists, who pay money to view them. Another economic aspect of these animals is that of their valuable by-products. Horns, hides and skins fetch high prices in the international market. According to Victoria Chitepo, Zimbabwe's minister of Tourism and Natural Resources, wildlife activities in 1986, brought more than Z$200 million (some of it in foreign exchange) to the national economy. About 50% of this came from communal areas, where the majority of rural women are based. The minister argued that, if properly managed, these wildlife activities could bring residents more revenue than they obtained from crop cultivation. She further pointed out that there was less competition in wildlife products on the global markets (Zimbabwe Herald Newspaper, 2/7/87). The Minister, however, did not expand on how this revenue would be distributed so that household food security would not be threatened. She also did not touch on entitlement, which to a large extent would determine how the revenue from these activities could be distributed among the local people.

This emphasis on economic advantages at a national level overshadows some important issues which arise at the micro or community level. Some governments are beginning to recognize the importance of paying attention to the micro-environments that sustain natural resources. A move in that direction is positive because it will eventually force governments and policymakers to address women's natural resource management problems. The government of Zimbabwe is beginning to address micro-environment issues and June 24th 1987, the Presidential address to parliament spelled out the governments intention to give the issue more focus. President Robert Mugabwe stated that:

> "With regard to wildlife management, it is my government's intention to extend this responsibility to the communal people through the introduction of management of indigenous resources." (Zimbabwe Parliament, 24/6/87).

Such a policy is useful in that it shifts attention to women's use of wildlife resources. Furthermore, by focusing on the management of indigenous resources, this policy allows for the incorporation of some traditional practices which might enhance management of these resources. The important role of wildlife as a source of food can thus be accorded recognition at both the micro and macro-levels.

WOMEN'S PROBLEMS IN WILDLIFE MANAGEMENT

Problems resulting from the relationship between women's wildlife management activities, crop production and household food security tend to be either ignored or understated. For many rural households in Zimbabwe, wildlife resources - which are often thought of and treated as "pests" - constitute an important part of the diet. The situation is paradoxical because the availability of these pests, which threaten crop production, is reduced by a variety of agricultural practices. Some ploughing, weeding practices and the use of certain biological inputs reduce the availability of pests as a source of proteins and are themselves health hazards. The use of pesticides to destroy pests, often renders them unfit for human consumption. Agricultural practices such as the spreading of fertile soil from termite mounds reduce the availability of termites which are a very popular part of the diet. The mere act of clearing new land for agricultural expansion causes wildlife resources to diminish. Since within each ecosystem, various animal species find their particular habitat, i.e. areas that meet their requirements for food, water and shelter from weather and enemies, the clearing of land for agricultural development creates an unsuitable environment for the species. No wildlife species will survive for long if its environment becomes unsuitable. This situation is found to be undesirable not only from the conservationist point of view but also for rural women whose source of protein diminishes.

The problem of dealing with wildlife resources that destroy crops take on a different form when it involves animals such as elephants and baboons. It is illegal to kill elephants or baboons, for whatever purpose, in the absence of a licence. This is partly because these wildlife resources attract tourists which bring revenue to governments. Secondly, wildlife products such as ivory and hides have a high value on the international market. Because of these factors, women have to devise acceptable strategies for dealing with these animals. In most cases, they have had to spend long hours in the fields scaring these animals with using different sounds and constructing forms or shapes that represent their enemies.

The task of preventing larger wildlife from destroying crops is very time consuming. It takes women away from other households chores including the activities that increase household food supplies. Since the revenue from tourism and wildlife marketed products of does not accrue directly to rural households, the existence of wildlife such as elephants and baboons in most rural areas is seen as a direct threat to household food security and income.

One might argue that rural people could apply for licenses to shoot down these animals, which then could serve as their protein supply. However, to get a hunting license one must have an approved weapon and should be literate enough to complete the application forms. Furthermore, a potential hunter must have physical access to the centres where applications are submitted and processed. All these are barriers that exclude rural women from shooting larger animals to make their tasks easier and less time consuming. In addition, the meat of these larger animals has not been readily accepted in the diet of most households. Most people do not enjoy meat from elephants and baboons so that even if they were to slaughter them it would be for the purpose of getting rid of them and not to gain access to meat. In this case, there would be no direct contribution to household food security except in the way of reducing the threat to crop production.

The above discussion is biased towards those activities relating to crop production because it attempts to highlight problems that arise for household food security when want to get rid of pests and at the same time want to preserve them as a source of protein. Women are also involved in the management of wildlife resources that have no direct impact on agricultural production. As indicated previously, most rural households have limited access to meat. Only those with livestock get access to milk when it is available. Eggs are generally considered a luxury food and are frequently reserved for reproduction. Fish is not a common element of the diet in many parts of Zimbabwe. As a result, small wildlife resources such as caterpillars offer a readily available source of protein. It is important to bear in mind that this is an aspect of the diet that is enjoyed by most households.

We have already noted that the gathering of these wildlife resources is primarily the responsibility of women. The processes of acquiring these resources are generally time-consuming. There are hardly any labour and time-saving technologies that have been developed to facilitate these tasks. This may be due to the fact that the market value of these wildlife resources is localized and the consumption of some types is area-specific. The development of technologies to facilitate these tasks has not received much research attention even within Departments of Nutrition. Women thus must spend long hours shaking caterpillars from tree tops, digging out crickets in the fields, chasing after termites and locusts and trapping rats. Because of time constraints women sometimes are forced to engage in bad management practices such as setting large tracts of grasslands on fire to trap rats and rabbits or cutting down trees to gain easier access to caterpillars or cicaders. These practices are devastating to the environment, particularly where there are problems of overgrazing and deforestation.

The discussion above clearly suggests that most of the management activities associated with wildlife, effect either grasslands, natural woodlands or both. In managing wildlife resources, women cannot separate issues relating to grasslands and natural woodland. In their efforts to achieve the goal of household food security through the acquisition of wildlife resources they undermine other sources of food. For instance, loss of grasslands, through fires reduces stockfeeds and therefore diminishes milk products and other livestock products.

Some of the most common causes of grassland degradation are excessive grazing or ill considered attempts at farming. Population pressure continues to force people to clear new pieces of land. For example, Zimbabwe's population is estimated to be growing at the rate of at least three per cent per annum. It has been estimated that each year, an additional two percent of Zimbabwe's land surface is cleared for cultivation and other purposes such as settlement. In the majority of cases, these new settlements are on marginal lands where there is competition between human and animal populations for the available limited resources. Most of these new settlements cannot sustain crop production activities thus the need to supplement the diet with wildlife and plant products is even more pressing.

Loss of grasslands also implies a loss of wild plants that are a source of food to many households. Wild vegetables are widely consumed in many parts of Zimbabwe. Wild derere (the Shona name for okra), nyovhi and mushroom are a very popular part of the diet. Although these are seasonal, they are often dried or preserved so that they are available for consumption throughout the year. Wild fruits are another important grassland food resource. Fruits such as gooseberries, tsambatsi, and other wild berries are often used to supplement children's diets. When they are in season, they make a significant contribution towards a favourable household nutritional status. The gathering of these fruits is frequently done by children. In the absence of children, of an appropriate age, women carry out this task.

baboons. It is illegal to kill elephants or baboons, for whatever purpose, in the absence of a licence. This is partly because these wildlife resources attract tourists which bring revenue to governments. Secondly, wildlife products such as ivory and hides have a high value on the international market. Because of these factors, women have to devise acceptable strategies for dealing with these animals. In most cases, they have had to spend long hours in the fields scaring these animals with using different sounds and constructing forms or shapes that represent their enemies.

The task of preventing larger wildlife from destroying crops is very time consuming. It takes women away from other households chores including the activities that increase household food supplies. Since the revenue from tourism and wildlife marketed products of does not accrue directly to rural households, the existence of wildlife such as elephants and baboons in most rural areas is seen as a direct threat to household food security and income.

One might argue that rural people could apply for licenses to shoot down these animals, which then could serve as their protein supply. However, to get a hunting license one must have an approved weapon and should be literate enough to complete the application forms. Furthermore, a potential hunter must have physical access to the centres where applications are submitted and processed. All these are barriers that exclude rural women from shooting larger animals to make their tasks easier and less time consuming. In addition, the meat of these larger animals has not been readily accepted in the diet of most households. Most people do not enjoy meat from elephants and baboons so that even if they were to slaughter them it would be for the purpose of getting rid of them and not to gain access to meat. In this case, there would be no direct contribution to household food security except in the way of reducing the threat to crop production.

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Sometimes they do so even when children are available, combining it with such activities as gathering wild vegetables and fuelwood.

Although grass itself is not consumed by rural dwellers, it makes an important contribution towards household food security. Throughout Zimbabwe's rural areas, food storage facilities are constructed from grass, wood and soil products. Almost all of the roofing of storage facilities is done with thatching grass. In fact, most of the buildings in rural areas are grass thatched. Women often walk long distances to cut grass and transport it to where it is to be used. This task is becoming increasingly difficult to perform as well as time consuming because of the continuing loss of grasslands.

Similar problems arise form deforestation. Firstly, deforestation results in the reduction of an important food source. Women and children gather a variety of wild fruits at different times of the year. In addition, these wild fruit are often an important source of cash. Where available, women gather large amounts of wild fruit and sell them to travellers, to local people at the market or travel to city markets where they sell to urban dwellers. After disposing of their fruit at city markets, they often use the money to buy sugar, salt, bread and other household food requirements.

Woodlands are the major source of energy for cooking and heating requirements of the majority of rural households. According to a report prepared by the Beijer Institute, almost 47% of Zimbabwe's total energy consumption is from fuelwood. Eighty-one per cent of the energy demands of rural households is met from fuelwood. (Beijer Institute, 1986) The problem of scarcity of fuelwood has been escalating in recent years. In many parts of Zimbabwe, women travel four kilometers or more to collect fuelwood, and this collection trip often takes more than two hours to complete. A construction wood collection trip can take longer. Sometimes women travel up to ten kilometers taking up to six hours to complete the trip. Management activities associated with the collection of firewood and construction wood have placed considerable pressure on rural women. These activities involve the identification of the best tree species for a particular function, the choice of which trees to cut down and how to cut them. As woodlands become more deforestated, the tasks become more difficult and time consuming to perform. In the end, women are forced to cut down trees and bushes indiscriminantly because of the time pressure and scarcity of resources.

These fuelwood problems arising from deforestation may not appear to have any bearing on household food security other than to make food preparation processes more difficult. However, any tasks that place such demands on women's time affect the household food security situation negatively. It means that some of the time they could have spent working in the fields, in their gardens, gathering wild vegetables and fruit and catching wildlife resources, is reallocated to fetching fuelwood. This reduces the household's inflow of food. The more acute the problem of deforestation becomes, the more pressure is felt on household food systems.

A number of African governments have recognized the gravity of the problems of deforestation. In many countries, governments are implementing programmes for reforestation, which are aimed at alleviating the situation. In most cases, however, the programmes are not addressing the real needs of those people that are most affected. In Zimbabwe, for instance, scarcity of fuelwood is most pressing for rural women. Yet, the government programme for reforestation focuses on planting eucalyptus trees which are the major source of construction wood. This tree species is generally not considered very good for fuelwood, partly beca[illegible]t does not produce long lasting charcoal. In addition, the eucalyptus tree has less popularity because in areas where it is planted, it diminishes other vegetation. Planting eucalyptus reduces the supply of grass and other wildlife resources that are traditionally used as part of the household diet. A related reason for the lack of attraction of the eucalyptus tree for rural women is that it does not bear any fruits to supplement the diet. It is purely a cash crop tree and makes no direct contribution towards household food supplies. Furthermore, it takes several years to earn cash, although most reforestation programmes favour this species because it is fast growing. It would be more beneficial if reforestation efforts took a multipurpose approach to the problems of deforestation. Focus should thus be on planting indigenous fruit bearing trees which would make a direct contribution towards household food security. It is also desirable to include the more favoured fuelwood species in the tree planting programmes.

CONCLUSION

Women's involvement in natural resource management has been underestimated primarily because it has not been seen as part of their important responsibility of ensuring continuous supplies of household food. The role that women play in natural resource management is further disguised by the fact that official statistics on household food supplies have failed to incorporate food from non-agricultural plant and wildlife resources. The general tendency has been to use agricultural food supplies as the key indicator for dealing with food security questions.

This paper, has attempted to draw attention to the link between natural resource management and household food security. It makes the point that processes leading to the provision of food supplies in African rural households, are a component of natural resource management. In light of the fact that African women are estimated to provide about 80 percent of the subsistence food, this paper concludes that their involvement in the management of natural resources is also proportionately high.

The paper discusses, in some detail, problems resulting from contradictions which are inherent in women's natural resource management activities. These problems have received limited attention from researchers and policymakers. This is partly because most research on household food security has not taken an integrated approach. It has taken agricultural production as the source of household food security and neglected other sources, particularly wild animals and plants. This has resulted in important traditional contributions to the rural diet being pushed to the periphery of national policy. In fact, wildlife resources continue to be marginalised in national policy as the problems of environmental degradation and demographic pressures worsen. Consequently, efforts have not been made to develop these other important sources of food. Thus household food security has been undermined and women's natural resource management activities have also been made more difficult.

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WOMEN AND MILK IN AFRICAN HERDING SYSTEMS

Bonnie Kettel

RECOGNIZING WOMEN IN PASTORAL PRODUCTION

This paper constitutes a plea for a new focus in research on the productive activities and responsibilities of women in the African rangelands. It calls for a new vision of the importance of women's work in livestock herding, particularly a new view of women's responsibilities in the provision of milk. This plea is intended as challenge to the enduring invisibility of women in African herding systems and as a new approach to the recognition of women's interests in pastoral development.

The rangeland areas of Africa occupy a vast stretch of the continent in two district regions: the Sahel-Sudan zones that form the southern border of the Sahara and the grasslands of eastern and southern Africa. Across Africa -- in these arid and semi-arid regions and in the better-watered small farm areas -- animals provide a means by which natural resources in grass, browse and water are converted into milk and other products for human use. Women's activities in milking, animal care and the provision of water and fodder are essential to this process. Nevertheless, the importance of women's tasks and interests in milk production has long been underestimated in the research literature on African herding systems (but see Dahl 1987).

This devaluation of the importance of women's work in livestock herding is apparent in a report published in Nairobi in 1983. The report is based on a seminar held at the University of Nairobi to consider prospects for development in the semi-arid Kerio Valley. One of the goals of the seminar was to recognize the importance of pastoralism in the valley economy (Kipkorir, Soper and Ssennyonga 1983: ix-xii). From the report, we learn that in the Kerio Valley men are responsible for the "high duties" of livestock management, while women's activities in pastoral production are limited to "everyday chores" such as milking (Tanaka 1983: 58).

I am interested in the background of assumption that allows social science researchers to differentiate between men's activities and women's tasks in livestock herding using a vocabulary that implicitly belittles the importance of women's work to the pastoral production process. Over the years, this vocabulary of analysis has received considerable academic support and has come to occupy a central position in the received view of women's subordination in African herding systems. According to the received view, men's interests, responsibilities and rights in the use of productive resources -- including livestock -- have an overarching importance in pastoral production. As a result, women's avenues of authority are said to be severely circumscribed and limited to personal influence in the domestic realm (see, for example, Schneider 1979).

Much of this received view was first set forward by Engels, who argued that livestock herding was the original basis for the "world historical defeat of the female sex" (Engles 1972: 120). Engels attributed this defeat to the importance of men's ownership rights in livestock, which provided men with a propertied basis for the exploitation of women's domestic labour. In a remarkably similar analysis, Llewelyn-Davies attributes the lack of autonomy that she suggests is characteristic of Maasai women to the fact that Maasai "culture" -- and Maasai men - deny women the right to ownership of animals (Llewelyn-Davies 1979: 121). This paper suggests that this received view of women's subordination in indigenous African herding systems has come to constitute an image of the "traditional" (Stamp forthcoming 1989) that acts as a barrier to our understanding of the nature and importance of women's work, particularly women's work in milk production, in this setting.

Let me make clear that my criticism of the received view is not that it is incorrect. Indeed, it appears to offer an increasingly accurate interpretation of the limits on women's autonomy and authority among African livestock herders. However, the received view does read the present into the past in a manner that is simplistic and "Eurocentric" (Robertson and Berger 1986). As an example, Llewelyn-Davies' analysis of "Maasai thought" ignores any consideration of the impact of colonization, commoditization, or drought on the lives of Maasai women (Kettel 1986). The consequence of such an analysis is an image of the traditional that distorts our comprehension of the factors and processes that are affecting the well-being of women in pastoral communities in the 1980's. What particularly horrifies me about the received view of women's subordination among livestock herders is that it is coming to serve as an ideological justification for the denial of benefits and opportunities to women in their own households (Oboler 1985) and in pastoral development (Broch-Due, et al 1981; Cloud 1986).

It is only by surmounting the inadequacies and distortions of this image that we can hope to achieve a better understanding of women's needs and goals in their use of animals and other pastoral resources. A focus on milk, which is frequently the purpose of women's work in herding, offers us a strategic window through which we can acquire a better understanding of women's interests in livestock production, as well as some insight into the sources of respect and authority that were once available to women in African herding systems.

Several questions are raised by an emphasis on milk as the object of women's work in pastoral production:

1. how is women's labour organized specifically by their involvement in milk production;

2. how do women balance their use of various resources, including their own labour, their rights in animals, and their access to water and fodder to ensure the best possible supply of milk for their households;

3. how are women's interests and rights in milk production related to their autonomy and influence in their own households;

4. how do women cooperate and compete with men and with other women to ensure their own access to milk;

5. how do women use their rights in milk -- as well as in butter (or ghee), hides and animals -- to enter into relations of exchange with other women;

6. how are these relations of cooperation, competition and exchange related to women's search for prestige and influence in their own communities;

7. how is the particular association between women and milk (or butter) related to women's access to authority in astoral communities, past and present; and

8. how can women's complex interests in milk production be recognized in the context of pastoral development?

Together these questions form the basis for a new image of the economic and social importance of women and their work among African livestock herders. This paper provides a preliminary overview of this image as it relates to women's use of pastoral resources -- including livestock, water and fodder -- and to the consequences of commoditization, drought and pastoral development on women's lives.

THE DOMESTIC REALM OF AFRICAN PASTORALISM

My perspective on the importance of women's work in milk production is based on field research with the Tugen, an agropastoral people, some of whom herd their livestock in the lowland areas of Kenya's Baringo District -- including parts of the Kerio Valley -- on my general experience of other herding peoples in the Kerio Valley region, and on the extensive literature on African pastoralism (Galaty et al. 1981, Galaty and Saltzman 1981, Rigby 1985).

On the basis of this research, I have previously argued that the minimal unit of production in African herding systems is not the individual male stock-owner, but the domestic group or "household" (Kettel 1986). I am not suggesting here that women's activities in livestock herding should be seen as domestic tasks, but that indigenous herding strategies in the Kerio Valley -- and across Africa -- are ultimately based on the domestic group. It is primarily, but not exclusively, within these residential units of production and reproduction -- which exist in a variety of forms in the African rangelands -- that women and men act as participants and as decision-makers in the pastoral production process.

In order to appreciate the significance of the domestic group as the ultimate locus of pastoral production, we need to look at what livestock herders actually do to maintain their subsistence. For the most part, indigenous African herding systems are based on dairying rather than on meat production (Dahl and Hjort 1976). This dairying process has two essential aspects: stock-breeding, which maintains the herd; and stock-milking, which maintains the domestic group (Dahl 1987). Responsibility for these two aspects of the production process is frequently allocated on the basis of gender, with men's activities centering on the overall management of the herd while women's concerns are focused on the milk supply.

In general, men's responsibilities in stock-breeding have been seen as constituting a public phenomenon, one that links male stock-owners in their common use of grass, browse and water. Milking, on the other hand, has been understood only in a domestic context, as an aspect of food processing or 'cooking'. On the whole, this artificial distinction between public and domestic roles in pastoral production fails to recognize that herd management cannot be understood separately from the milking process, that the context within which these interests intersect is the residential group -- where milk is primarily consumed -- and that it is the cooperative links between women and men in the household that make both milk production and herd reproduction possible (see, for example Evans-Pritchard 1951: 130 and Gulliver 1973: 384).

In the work of the Swedish anthropologist, Gudrun Dahl, we can find a new and insightful awareness of the importance of milking to the pastoral production process. Dahl draws our attention to the symbiotic relationship that emerges between people and their livestock in the task of milking. In order to yield well, livestock - particularly cattle-- require continuity and familiarity with the people who milk them. The milking relationship that develops between the milker and the cow, and also the calf, is a continuing context of animal domestication in pastoral production systems (Dahl 1987: 251-252). It is also in milking that livestock herders must balance the needs of their households against the needs of the calves and the future of the herd as a reproducing resource (Dahl 1979).

In livestock, as in humans, lactation is a consequence of gestation. As a result, subsistence dairy herds must be structured for successful reproduction and must include bulls and young male stock as well as milk-producing females. It is for this reason that a number of animals are commonly required to sustain a residential group. Estimates from the cattle-herding peoples of eastern Africa vary from 8 to 12 animals per person. In the dry season, or during a prolonged drought, this number increases and may reach 20 cows for every adult (Rigby 1985: 133). Camels, cattle, goats and sheep all have different requirements in herding and these, in association with the distribution of natural resources in forage and water, largely determine the overall size and composition of the herd, the pattern of human settlement, the distribution of animals in homesteads and herding camps, and the seasonal and annual availability of milk. In every case, human labour is the crucial ingredient that brings animals, people and natural resources together for dairy production.

WOMEN'S WORK IN LIVESTOCK HERDING

It is commonly suggested that men's work in herding is the most important labour component in pastoral production (see, for example, Talle 1987: 63). In my view, this assertion lacks credibility. As Dahl points out, women's tasks in herding are frequently the most labour-intensive aspects of the pastoral production process. Women's involvement in pastoral production reaches its zenith among livestock herders in the East African grasslands. In this setting, women act as the primary milkers of cattle, in addition to caring for young calves and sick animals and having an overall responsibility for the herding of small stock, such as sheep and goats (Dahl 1987). In a study of labour allocation among the Kenya Nandi, who are agropastoralists, Regina Oboler found that women were engaged in herding tasks in 7.7 per cent of all observations of women's labour activity, whereas the figure for men was only 4.4 per cent (Oboler 1985: 206-207). Nandi women were involved in a number of pastoral activities in addition to milking, including herding, taking livestock to the cattle dip, and for various veterinary services such as inoculation and artificial insemination.

It is worth pointing out here that many of women's tasks in pastoral production, such as milking, involve activities that must be carried out on a daily basis. Providing water and fodder for young and sick stock is a time-consuming task, one that can add considerably to the burden of collecting water and firewood for human use. Much of actual herding-- in the sense of moving animals to pasture -- is not commonly done by men, but by children and adolescents, including girls who play a particular role in the herding of small stock. As a result, it is women, in contrast to adult men, who are indeed responsible for the "everyday chores" of pastoral dairying. Men's "high duties", which include the overall distribution of animals in relation to one another, and to water and pasture, as well as the more dangerous tasks of bleeding, castration and slaughtering, do not require daily labour. From this point of view, it is women's work that acts as a limit on the size and distribution of household herds in indigenous African herding systems. This is particularly the case since it is also women's work in childrearing that provides men with access to a child labour force.

As this discussion suggests, women in pastoral communities are frequently involved in balancing a complex interplay of necessities and goals. They have a continuing responsibility for household work, child care and supervision, and the care and supervision of livestock (Dahl 1987: 256). The element that connects these separate domains of women's labour activity is their work in the production and distribution of milk. Thus, I suggest that a focus on women's work in milk production will help us to appreciate the complex nature of these demands, the manner in which pastoral women prioritize their use of time and natural resources and the way in which this balancing process is affected by environmental constraints, as well as by regional planning strategies for livestock herding.

DAIRYING AND WOMEN'S LIVES-STYLE

The nature of women's involvement in milk production appears to be an important element in the strong sense of personal identity that so often characterizes women in pastoral communities (Evans-Pritchard 1951: 130, 134; Gulliver 1966; Oboler 1985; Kettel 1986). According to Gulliver, Turkana women always travelled with a milking camel, which they milked themselves (Gulliver 1966: 131). When camels, which are superior milk producers, are added to livestock herds, as they are in northern Kenya and across the Sahel, men commonly assume the task of milking these large animals. However, across this camel-herding zone, the distribution of milk from small stock, cattle and camels continues to be the privilege of women (Beaman 1983, Cloud 1986: 34).

Although indigenous African herding systems are based on dairying, little attention has been paid to the importance of milk in the quality and meaning of life in pastoral communities (but see Stenning 1959). This neglect particularly affects our understanding of the benefits and difficulties that women experience as milk producers. For livestock herds, milk is more than a primary element in the daily diet. It is also, I suggest, a metaphor for the forms of sharing in work and consumption that make a pastoral subsistence possible (see Beaman 1983: 24).

Gulliver offers us some insight into the social and symbolic significance of milk in his description of homestead life among the pastoral Turkana. In this setting, livestock herding centered on the provision of a domestic milk supply that was assigned first, foremost and in every circumstance, to the children of the homestead (Gulliver 1966: 57-58, 130). Gulliver also reported that he had never seen, nor could he imagine, a Turkana women who would refuse to share her milk supply with a women whose children needed milk (Gulliver 1951: 91-92; quoted in Wienpahl 1984: 201). This child-centered view of pastoral production, which is based on field research carried out forty years ago, is refreshing and worth thinking about as we attempt to assess the quality of women's lives among African livestock herders.

In spite of its demands, dairy herding -- particularly in its indigenous forms -- also offers women some important benefits. As a basis for subsistence, dairying can be less onerous for women than a dietary dependence on grain crops. Milk is a food that requires little preparation. In producing milk, livestock act in place of human labour, converting water and pasture directly into food. Maize, on the other hand, must be ground and cooked -- with water -- using fuelwood, charcoal or some other energy source. When milk is replaced with maize, women's necessary labour-time in water and fuelwood collection, and in food preparation, may be substantially increased. Ensminger, who compared fuelwood use among nomadic and sedentary Orma in Kenya, found that sedentarization, along with the addition of maize to the daily diet, increased women's work in wood collection by 1300 per cent (Ensminger 1987).

Nomadic herding may also offer women an advantage in labour sharing that is often denied to women who live in nuclear households in sedentary communities (Ensminger 1987). The primary basis for cooperation in milk production is the residential group, particularly co-wives and their adolescent daughters. Talle offers us an excellent description of the companionship that exists among Maasai women (see also Llewelyn-Davies 1979): "Many of the women establish close friendships and support each other in various ways: They fetch firewood and water together, lend each other ... milch cows, help each other with house-building and child-care and cooperate in arranging feasts and celebrations" (Talle 1987: 63).

These forms of labour sharing help to balance out women's work in milk production and ensure every woman with adequate access to milk. They also provide the context of friendship and support within which pastoral women act as independent milk producers. Women begin to establish their own autonomy by participating in wider networks of support and exchange. In order to do so, they use their rights in milk, and also in butter, meat and hides, to establish relationships of reciprocity with other women -- and occasionally with men (see Talle 1987). We know very little about how pastoral women participate in exchange networks, what impact this has on their personal influence and prestige, or how these exchange networks fit into the larger pastoral economy.

On occasions when a man in a pastoral community asks another man for the loan of an animal, this is commonly referred to in the pastoralist literature as "establishing a stock partnership", an activity that is considered important -- and public -- because it contributes to the management of livestock herds. When a women asks another woman for a gift of milk, this activity, which is considered personal and domestic because it contributes to the feeding children, is often labelled as "begging" (see Beaman 1983: 23). Nevertheless, it is clear that women's begging is just as important to pastoral communities as the exchange of animals in stock partnerships.

Beaman stresses that women, in this case Rendille women, use their rights in the distribution of milk and other livestock products to "lay the groundwork for reciprocal help" when they need it (1983: 83). In order to do so, women will act generously by making gifts of milk and meat to other women when they have a surplus:

> ...women try to establish a sense of obligation in others by offering small gifts ... and they keep careful track of those who have successfully begged a share of a resource from them. Then in return they feel free to demand a portion when the other is in a position to share ... A woman has established networks of women among whom she can make demands, including her own kin, her husband's kin, near neighbours, and other connections... A skilled woman keeps a mental record of her relationships with others, in what amounts to a mental card file. These networks can be vital when hardship strikes and she must feed her family. The broader her network, the greater her chances of maintaining a consistent flow of food into her household (Beaman 1983: 24).

The generosity that men display in lending out animals to neighbours in need is frequently a basis for political influence and prestige in herding economies. Dahl comments that she has never seen the kind of sharing that women do, particularly milk-sharing, "referred to as a means for female personal aggrandizement" (Dahl 1987: 264). I suggest that this may be because so many pastoral ethnographers have failed to recognize that women's activities in milk production were a basis for their larger involvement in community life in indigenous African herding systems.

Carstens provides us with an initial assessment of this issue in his analysis of female initiation ritual among the Nama, who traditionally herded their cattle in southern Namibia and adjoining regions of South Africa. Carstens relates the content of these rituals, which "dramatized a women's elevated position in ... the domestic economy" and "presented her as an indispensable figure for the community" specifically to the control that Nama women had over the distribution of milk (Carstens 1982: 512).

Carsten's analysis of the importance of milk in the social lives of Nama women is appropriate to the new image of women's involvement in pastoral dairying that I have put forward here. In establishing this image, I have drawn on the broad base of data on African livestock herders to suggest that women across the miles of Africa, from Namibia, to Kenya, and throughout the Sahel, have acquired support, dignity and even some level of authority from their involvement in milk production. This image is not intended to disguise the considerable variation in women's work and influence that exists among African herders. It is, however, meant to establish a new avenue of analysis within which we can begin to assess the sources and impact of these variations in women's lives.

I must note here that, with the possible exception of Carstens--whose data on the Nama is based on sources from the 1920's (Carstens 1982: 508) -- few pastoral ethnographers would readily accept the validity of my image of women's autonomy and authority in African herding systems. Instead, most would argue, as Gudrun Dahl does, that women's rights in milk production are generally "mediated" through male herd owners, and that women thereby "tend to become jural and political minors to men" in herding societies (Dahl 1987: 257, 261-262). It is to this issue of women's property rights in livestock that we must, therefore, turn our attention.

MEN'S PROPERTY, WOMEN'S COW

Almost everything we know about community life among African herders has been written by men, and based on research with men (but see Dahl 1979, Sperling 1984, Oboler 1985, Clud 1986, Ensminger 1987, and Sperling 1987). As a result, the pastoral literature offers a view of social reality that I suggest overestimates the scope and impact of men's property rights in livestock in indigenous African herding systems.

In my previous writing on this issue, I have stressed the importance of women's rights in "house-property" (Kettel 1986 and also Oboler 1985). House-property, which is characteristic of many East African herders, consists of rights in livestock, particularly -- but not exclusively--milking stock, which are assigned to women at marriage. Men do not have free rights of disposal over animals which have been assigned to a woman as her house-property, since they are considered hers to use for the benefit of her children, and neither they, nor their offspring, should be loaned out, given away or sold without her consent. Women actively manipulate their rights in these livestock in their own self-interest and in the interests of their children, particularly their sons (see Little 1987). It is from their mothers' share of homestead herds that men typically receive and inherit animals from their fathers. Maasai women actually control the distribution and inheritance of their house-property and may thereby deny errant sons access to animals (Llewellyn-Davies 1979 and 1981).

Among livestock herders in eastern Africa, the assignment of house-property, which usually occurs at the beginning of a woman's marriage (Kettel 1986: 55), is often negotiated with the participation of women, particularly the husband's mother, his existing wives and the young bride. It is in the context of these relationships between women that a first wife will actually help her young husband to acquire rights in animals from his father's herd (see also Gulliver 1966). It is also in this context that each new wife must begin to carve out her own productive autonomy within the domestic group.

Women's individual interests in house-property make them crucial actors in the overall management of herds and their inheritance by men. This pattern of differential and intersecting rights in livestock is an important issue for pastoral development projects, which are commonly based on the assumption that male "heads of households" are the sole and absolute owners of family herds (see Cloud 1986). Men do have management rights in all of the animals in homestead herds, and when asked they will invariably describe themselves as "owners" of all these animals. But they cannot act as sole owners of their wives' house-property and still less of their wives' livestock without generating considerable tension in their own households and debate in the larger community.

Women's possibilities for sole ownership of animals, whether by gift, inheritance or purchase, vary considerably in African herding systems, but they do exist. Information on women's rights in livestock, whether shared or private, is usually obtainable only from women, who negotiate their interests in livestock with their husbands, their brothers (Little 1987) and even their "best friends" (Talle 1987). As evidence for the importance of women's ownership rights in livestock, we can use the work of Marieanne Rupp, who interviewed Tuareg and Fulani herders in 1976.

Rupp was evaluating the success of herd reconstitution programs in the Sahel following the drought years of the early 1970's. One of the central elements in these programs was the assignment of replacement stock to men as "heads of households". According to the Tuareg and Fulani she interviewed, herd reconstitution was creating considerable social damage, since none of the animals owned by women were being replaced. As a result, young men and women were unable to acquire bridewealth and dowry from their mothers, and women's influence and status in their own households and communities was being undermined (Rupp 1976; quoted in Cloud 1986: 33-34). This outcome is a testimony to the nature of women's experience of pastoral development in the African rangelands.

DROUGHT, DEVELOPMENT AND THE FUTURE

Throughout the 20th century, particularly since the 1960's, the needs and responsibilities of women as milk producers have been significantly jeopardized by the ongoing destruction of the African rangelands. During this time, nomadic pastoralists who preserved the African rangelands by using broad stretches of it, and by moving their herds in search of graze and water, have been limited to a smaller and smaller land base. They have lost land to European colonizers, to agro-business, to small-scale farmers, and to game parks.

In the contemporary setting, with a reduced land base and often living in permanent settlements, African herders have become profoundly vulnerable to drought. In such times, the burden of women's labour activity in herding increases enormously with the increased number of sick and weak animals, and the need for women to travel further and further distances to provide them with fodder and water. One consequence of this increased labour burden is overgrazing, and thus, increased desertification.

Attempts to maintain the rangelands, as well as the lives of pastoral peoples themselves, have largely focused on the introduction of forms of pastoral production organized around production for the commercial market, including production for export, rather than subsistence production for domestic use. Among nomadic pastoralists, commercial livestock production is commonly based on ranching and the production of meat for urban markets in Africa and for export abroad. Meat herds are maintained by letting the calves run with the cows--which means that cows are not available for milking -- and by continuous culling of the herd to provide income. In this case, women lose their access to the milk supply, as well as their rights to animal hides.

As ownership of livestock becomes an element in commercial production, women also begin to lose their property rights in animals, particularly their rights in house-property, to their husbands. In this new context, men do become "heads of households" as the sole legal owners of livestock. Little of the income that men acquire from commercial ranching "trickles down" to women, who may well find a new form of drought in these forms of livestock production. At the same time, women, who retain their traditional obligation to feed their children, find their burden of labour increased as maize replaces milk in the household diet. Their work in livestock production may also be increased by the increased proportion of calves in commercial meat herds.

Thus women, who underwrite the process of pastoral production through their continuing work in the care and feeding of children and livestock, are forced to suffer the consequences of both drought and development. Donor projects intended to alleviate the impoverishment of women that results from commercial ranching often seek to involve them in some form of handicraft production. Such projects also deny women any meaningful or satisfying involvement in pastoral development by assigning them a marginal economic role as housewives in search of supplementary income. I believe that the solution to these dilemmas lies with women themselves, and with their interests and rights in milk production. The appropriate context for these interests in the contemporary setting is in small-scale dairying.

As well as providing women with a central role in the development of their own communities, small-scale dairying may also offer a feasible and efficient strategy for increasing the economic potential of African livestock herds (Kyewalabye 1988: 11). Badri suggests that Sudan could save itself several million pounds every year by helping women to construct woman-run dairy farms (Badri 1986: 90). Sudan, which supports 55 million animals, presently spends 11 million Sudanese pounds annually to import milk powder and milk products. This expense is a direct consequence of Sudan's failure to recognize the potential importance of women's work in milk production for the national economy (Badri 1986).

Women-run dairy operations do require a complex infrastructure of support including secure access to livestock, fodder, water and veterinary supplies and services, along with facilities for cooling, storing and transporting milk. Nevertheless, the requirements for successful dairy production are not unique. They are comparable to those involved in the production and processing of coffee, a male-oriented export crop which has received support from many African governments and donor agencies. However milk is a perishable commodity, produced on a daily basis, and this alone suggests that women would benefit most from the introduction of dairy facilities close to existing roads and markets (see also Kyewalabye 1988: 15).

Whereas handicraft production ties women to the whims of the international markets, the demand for milk in Africa's cities and towns is secure and growing. Modern strategies for herd reproduction, such as artificial insemination, will allow Africa's dairy herds to be managed for minimal size — and minimal environmental impact. When they are herded on a small farm basis, milking stock can actually help to promote sustainable development by providing manure and helping to maintain soil fertility. At the same time, milking stock improve the domestic food supply, as well as providing a cash income.

The potential benefits of small-scale dairying emerge from an activity — milk production — that is a culturally appropriate source of income for women, particularly in Eastern Africa, where women are the primary milkers of livestock, and in the Sahel, where women are generally responsible for the distribution of milk. In these areas, the time has certainly arrived for national governments and donor agencies to recognize the importance of women's "everyday chores" in livestock herding and to support individual women and women's groups with improved services and facilities for dairy production.

The scientific community can play a useful role in this process by identifying women's work in milk production as an important focus for research. There is a particular need for the creation of interdisciplinary teams of researchers that will allow social scientists to work together on this issue with specialists in animal science and livestock production and development. The first stage in this new research endeavour must be our common recognition that the world is not flat, that received views can and should be challenged, and that there is much to be learned and gained from a new approach to the importance of women — and milk - in African herding systems.

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SECTION III

METHODOLOGIES

WOMEN, ENVIRONMENTAL PERCEPTION AND PARTICIPATORY RESEARCH

Anne V. Whyte

The simultaneous emergence of WID approaches to development, environmental perception and participatory research during the 1970's and 1980's is not accidental. In their origins and orientation, they have much in common. By 1975 (International Women's Year) it was recognised that development policies had failed to recognise women's contribution to development. In making this omission, they had both exacerbated the negative effect of development on women, and had doomed many projects to failure because the reality of women's roles was ignored.

A similar sense of disillusion was being experienced in the 1970's in a number of social sciences when it became clear that human behaviour did not conform with classical models of rationality. The relegation of more and more observed behaviour as 'irrational' (that is, not conforming to available scientific models) led to a questioning of the models themselves. Cross fertilization of ideas at the margins of economics, psychology, anthropology, geography and sociology, led to a collection of 'sub-disciplines' (e.g. cognitive anthropology, environmental psychology, perception geography, subjective utility economics) which analyze behaviour from the vantage point of the world as viewed by the individuals involved (the view from the inside to the outside) and not as viewed by the researcher or external agency (the view from the outside-in).

By the 1980's participatory research had emerged as a methodological strategy to respond to concerns about 'top-down' intervention strategies. These interventions generally did not meet the needs of those whose lots they were intended to improve, because they tended to follow western blue-prints rather than incorporating the knowledge and preferences of local people.

It is interesting that for more than a decade these three developments in the social sciences have run along separate, albeit parallel, tracks. All three share common origins in first questioning and then challenging established scientific conventions. All three derive their empirical legitimacy from the evidence of 'failed' development projects that can be found throughout the Third World. All three embrace the ideology that control over their own lives by any marginalised people, is a legitimate development goal. Environmental perception research has challenged social science models of how people behave; participatory research provides an alternative research methodology and WID focuses attention on that part of society which has been neglected by scientific and development practitioners alike. The identification of women and environment as a research theme is itself of major importance in research for development. This paper explores some interesting questions for women and environment and proposes a research approach which combines environmental perception models of behaviour and participatory research methods.

First, we must enlarge our 'scientific' notion of 'environment' to encompass not only the physical resources of rivers and fields but also the cultural attributes with which they are endowed.

Social vs Scientific Constructs of Environment

Analysis usually means reductionism; the narrowing down of a complex system to a few measurable interactions; the distance walked to collect firewood; the number of animal grazed on the commonland; the time spent in queuing for water at the pump.

Whether this behaviour is 'economic', or rational, or amenable to change, depends on the larger context in which decisions are taken. Social scientists have emphasised the socioeconomic components of that context (income, family size, ethnicity, etc.) in relation to available resources (land, water, etc.) but have tended to ignore the cultural dimensions of the environment for the resource manager. The environment is a cultural force; it underwrites group identity by providing a shared ownership of 'territory'; it reinforces common roots and a sense of 'home'; it locates peoples' memories and past histories in space; it provides powerful symbols for human fears and aspirations. And the environment -- with its changing allocations of scarcity and plenty, hazards and resources, provides us with explanations and judgements of our own behaviour (Whyte, 1978).

It is interesting that in science, as in every day language, the relationships between societies and their physical environment are conceptualised as social processes. The land with which we identify is called 'fatherland' or mother country'. We 'struggle with nature' and 'gamble on the weather'. Similarly, science has applied models of cooperation, conflict, negotiation, and gaming to our interactions with the environment, as though the environment was an active partner.

The environment is not, therefore, a neutral background against which human dramas unfold but can exert powerful forces on individual behaviour through the gestalt of culture. Particular places and landscapes provide strong territorial bonds, which are most strongly expressed when they are threatened. When the Masai were relocated in Kenya in the 1960's, they tried to preserve their set of spatial cues to tribal identity by renaming features in their new location with the same assemblage of names as in their former territory. For the Australian aboriginal the physical environment is seen as a 'living, age-old family tree'.

The environment is also rich in symbols. In Western culture, mountains have been symbols of the gods, of majesty and power; caves were seen as secret places, symbols of conspiracy and prophecy. Symbols can change; when wilderness was plentiful in Europe and North America, it was regarded as a place of rejection and disorder; today, it is a symbol of pristine nature. (Tuan, 1974. 1979).

The power of these symbols for social behaviour lies in the way they are organised culturally to form a code, which can then be 'read' by interpreting environmental signs, such as drought, earthquake, or locust swarms. In many cultures, the social construction, or interpretation of natural events is an environmental sign of approval or disapproval of social behaviour, which is then used to make individuals conform to social norms, to undertake great works or to rouse whole communities to war or to migration. There are also elements of this moral logic in current concern about the health of the planet which has been negatively affected by the profligate behaviour of modern industrial society.

Mary Douglas has written a number of books (1966, 1973, 1987) which develop the thesis that cultural interpretations of the natural environment are designed to maintain political power and control, and social cohesion. This not only applies to moral arguments about why a natural disaster struck a particular individual, but is also extended the elaboration of the whole 'code' including cultural taboos, oracles and divination and myths which explain the environment in human and moral terms.

A key concept in the analysis is that the notions of chance, neutrality and randomness are difficult ones for most societies, and for most individuals, to understand and accept because they involve uncertainty and lack of control on the part of those affected. Thus, a classic example in anthropology is the case of the falling granaries, under which Azande men were reported to habitually sit. Each granary which fell on the sitter beneath it was regarded by the Azande as a unique event, which required an interpretation of why that particular individual was there at the precise moment that the granary fell, and what actions in his life had led up to that event (Evans-Pritchard, 1937). The idea of measuring the number of hours each person sits underneath an unstable granary and assigning a probability of risk did not feature in the explanatory model used by the Azande.

Before we distance ourselves too far from such 'naive' explanations of what we now know to be statistical events, it is salutary to recall that considerable evidence exists in psychology to show that all of us share to some extent the Azande model of wondering "why him?", and even experts such as statisticians, are prone to analytical and judgemental errors because they use intuitive 'rules' when they consider events outside their area of expertise, or in relation to their personal lives (Kahneman, Slovic and Tversky, 1982).

Despite a rich literature in anthropology about cultural interpretations of environment and the role of taboo and myth, the analysis of gender in relation to environmental knowledge and attitudes is only beginning. In mythology, women and female deities are often assigned powerful roles in causing environmental events and personal misfortunes, structures by intent and sometimes by accident (Lefkowitz, 1986). In North America, national opinion surveys also show gender differences in relation to environmental attitudes, with women generally expressing more concern than men about environmental pollution, and particularly about environmental risks such as nuclear power. But most of our knowledge about how traditional cultures categorise the environment, and explain environmental processes in relation to natural resources are based on information gathered usually by men without attention to the particular domains of knowledge held by women.

Much of our understanding of other cultures generally, and of their relationship to their environments, specifically, is founded upon a male dominated transfer of knowledge. There are whole worlds to explore in understanding how women relate to the environment and how that knowledge is integral to cultural values and behavioural patterns.

Resource Perception and Resource use Strategies

Among the case histories of development projects that have failed, are many that concern the provision of potable drinking water. They are instructive in showing the wide differences in perceptions between the women who collect domestic water and the outsiders who provide the 'improved' facilities. Similar lessons about the need to take users' into account can be drawn from numerous projects to improve sanitation facilities, cookstoves, and reforestation; all which have paid insufficient attention to the attitudes and experience of local people, particularly women.

On the one hand, the provision of domestic water requires economic and technical expertise to identify the appropriate technology and water source, to ensure an adequate supply. The definition of what is appropriate and adequate, however, rests also with the consumers. The criteria used to assess alternative water sources, and the quality or potability of water are different for project personnel and local users. For western trained engineers, bacteriological quality and degree of sediment are the main criteria. For consumers, taste (especially mineral content), colour and temperature affect quality. Groundwater is commonly highly mineralised in tropical climates, and is perceived as too cold. (Whyte, 1984).

Another common difference between local and external evaluations of water sources is that local people know the multiple uses to which domestic supplies are put, and which has often led them to reject a project borehole as an acceptable source. Domestic water is necessarily multipurpose. It is used for personal hygiene, clothes washing, household cleaning, garden irrigation, watering domestic animals, and in cottage industries, as well as being consumed directly.

Since all these needs must be met on a daily basis, any technical solution that does not meet them will be supplemented by other, usually traditional, water services. In practice, this can mean that improved groundwater sources (covered wells, handpumps, boreholes with motor pumps) have either not been used at all (especially after the first mechanical problem), or have been used in conjunction with traditional, often polluted, surface water sources such as springs, streams and ponds (natural and artificial). It is difficult to prevent people, especially children, from drinking water when they have gone to a polluted source to bath, to wash clothes, or to water animals. On the other hand, the health benefits of having an improved source are not realised when polluted water is also consumed part of the time.

The need to take into account the perceptions and preferences of the users when designing improvements to resource use has been pointed out with respect to domestic water supply for at least two decades. Despite more attention being paid to local knowledge, new projects still repeat old errors.

A second example of resource use -- subsistence agriculture -- will also emphasise the need to understand decisions from the perspective of the decision-maker. In my experience, this approach has two benefits for the outside 'expert'; it gives him/her a healthy respect for the complexity of the decision-making process and for the choices made; and it identifies entry points where beneficial changes might be applied.

Figure 1 is a schematic representation of the decisions taken by Zapotec indian farmers in Oaxaca, Southern Mexico, who are farming a combination of corn (maize), beans and squash in a number of scattered plots (milpas) ranging from high and poor mountain land (piedmont) to relatively fertile flood plain land (low alluvium). Their main challenge is to match the geographic distribution of their planted fields with the pattern of rainfall in the growing season. In this semi arid valley, water availability is the critical factor in agricultural productivity (Kirkby, 1973).

An outside observer might note that the distribution of planted fields varies significantly from year to year. Even taking into account the need to rotate land in order to follow it, the planting patterns clearly reflect a purposeful strategy. A more careful observer would find that within fields there are differences in the variety of Indian maize selected, the proportions of corn that are planted compared to the intercropped beans and squash, and the density of the maize plants per hectare ranges from less than 9,000 to more than 80,000. An observer who had the opportunity to measure these patterns over a number of years would find that the combined effect of these planting patterns was not to maximise agricultural production in any single year, but to stabilize output from year to year, so that disastrous losses are avoided and minimum losses are as high as possible. In other words, the farming system is designed to reduce the variance in crop yield brought about by variations in climate and in geography.

In effect, this means that farmers are actively seeking to produce less in "good" years in order to ensure a minimum return on which they can survive, in the lean years. It is findings such as these that have led to the myth of the irrational subsistence peasant farmer, who behaves thus because he/she knew no better.

However, as figure 1 shows, the decisions involved in 'simple' subsistence farming in Oaxaca are complex. They involve:

(a) environmental judgements about the rainfall distribution of the current year compared with knowledge of soil moisture storage from last year; agriculture rotation needs, and the history of climatic variability;

(b) economic analysis of the cost of agricultural inputs versus expected outputs, particularly the cost of renting oxploughs (which increases as the early growing season progresses and the rainfall pattern becomes clearer) and the opportunity costs for household labour;

(c) political judgements about improving one's portfolio of land through social alliances, contributions to community endeavours, taking on political office;

(d) cultural values about social solidarity, the religions significance of maize, the desire to use all land productively, and the preference for long term sustainability over short term productivity.

Not only are the decisions complex in the knowledge and judgements they demand, they also lead to rational choices. The basis for this rationality is that individual farmers will not survive in such a marginal environment over a long number of years but that if they collectively pool both gains and losses, as a group they can survive. Thus farmers with a maize surplus in any year will contribute to the food needs of community members who have suffered harvest failure. Over the years, the community becomes a complex web of debit and credit ties between families. These both bind the individual to the community and act as a safety net for initiative and risk taking. Over the long term, these agricultural strategies and socioeconomic networks have enabled Zapotec farmers to survive in a marginal agricultural area for several thousand years.

In practice, Zapotec farmers adopt both gambling and highly conservative planting strategies. Their resistance to a new technology, such as hybrid maize varieties or deep wells, is not necessarily inherent conservatism. It is more likely a mixture of economic constraints (they do not have the necessary cash) and a desire not to disrupt the cultural and economic system that underwrites their survival before another group-insurance system is in place. When these new technologies are provided without due attention to their effect on the poorest of the community, their overall impact can be negative.

Implications for Research on Women and Environment

The two examples described above, of domestic water use and subsistence farming, illustrate a number of lessons for designing research:

(1) Even the 'simplest' choices are in reality complex and involve knowledge and judgement;

(2) The categories which we, as researchers, use to organise reality, may not coincide with those of the resource users;

(3) Choices are multidimensional; 'economic' decisions also involve social and cultural considerations;

(4) Individual choices are framed within a nested hierarchy of decision making; from the individual, to the household, to the community, etc.;

(5) Decisions are taken within the context of reality as perceived by the decision-maker; to understand these decisions one must also study the perceptions (values, attitudes, knowledge) on which behaviour is based.

The most important 'lesson' is that culture and environment are two parts of one whole. The farming system of the Zapotec Indians is as much a cultural system as it is an economic or agricultural one. Without the support of group solidarity, individual families would not long survive the vagaries of climate and geography. They would succumb to the crop losses caused by drought and floods. For them, as for subsidence farmers world-wide, food security means not only good farming practice but also good social relations. It is culture that underwrites individual resource losses in the short term; and it is by contributing to the maintenance of cultural institutions, that individuals invest in their own survival in the long term. Therefore, any analysis of decision-making and behaviour in relations to the environment needs to take into account the social and cultural context.

In principle, most social scientists would agree with this statement. In practice, the exigencies of western scientific method, mean that all too often the behaviour under study is excised from its social and cultural context for closer examination, and it is rarely reinserted into that corpus to see if it (or our understanding of it) is still viable.

Figure 2 schematically illustrates the epistemological problem. It illustrates that both the social and environmental "axes" are, in fact, nested hierarchies. Thus, an individual is simultaneously a member of a family, a community and a nation state. When the individual is the unit of analysis, these social groupings can be seen to have greater or lesser influence on his/her behaviour. Conversely, the 'behaviour' of household, or village is made up of the collective choices of its individual members.

Similarly, for the purposes of analysis, the environment is divided into individual components such as resources (land, water, fuelwood) or physiographic units (drainage basin, mountain slope) or territory (tribal lands, nation state). But, as is increasingly recognised, environmental processes operate across such artificial divides, to ultimately form a global environmental system.

The difficulty facing science is to devise methods that 'capture' the oscillations taking place between the different levels. All too often research becomes grounded in one cell in the matrix (usually at the lowest level of analysis) and strict limits are placed on the number of interactions that can be examined between the selected cell and others in the hierarchy. Furthermore, when research does move beyond one "cell", the analysis tends to be unidirectional across the matrix rather than oscillating between the cells. Again, social scientists tend to specialise at the 'micro' or 'macro' levels. This practice, reinforced by different methodologies at the two levels, further atomises any overall understanding.

How can research into women and environment do any better? To begin with, study of the topic itself can help to redress an imbalance in our understanding of culture and environment. Research on traditional environmental knowledge and cosmologies has been focused on men's views of the environment. We do not know whether women have different explanatory systems from men for describing, categorising and explaining environmental events and processes.

Western scientific understanding of the causes and human response to desertification, for example, may well be founded on a partial analysis of a partial analysis (that is, it is limited first by the reductionist tendencies of social science methods and second, by its focus on men's knowledge and behaviour). We do not know.

There is a need to document the role of women as preservers, creators and transmitters of indigenous knowledge about natural resources and the environment generally. Are there domains of environmental knowledge that are primarily held by women and passed from mother to daughter? How do these domains relate to, and interact with, those primarily held by men? How do they absorb new ideas and evolve over time? How have they influenced the course of development?

Second, how should we go about studying women and environment? Clearly, we should try to avoid the partial analysis. Methods which help the researcher to share the world view of the people whose knowledge and behaviour are being studied are critical. They include a range of qualitative and quantitative social science techniques for asking questions, making observations and listening (a much rarer practice than asking questions). More important than the particular technique used to obtain information is the relationship between the researcher and the researched.

In participatory research, this relationship is characterised by a sense of shared ownership, mutual learning and action (Maclure, 1988). Participatory research seeks to engage the "researched" in the research process by including them in the definition of research topics and priorities, in the collection of data and their analysis, and in the interpretation of the results for action. The research process is thus a learning process long before any 'results' are obtained.

It can readily be seen that such an approach presents a number of methodological difficulties. It requires more time and demands a different set of skills from researchers; local participants lack the skills and scientific training to systematically collect unbiased information and to analyze it; the learning process itself 'invalidates' the research findings because they are changed in the course of the study. These are all criticisms that have been made of participatory research (Maclure, 1988).

On the other hand, participatory research, like WID, enables a different kind of knowledge and experience to be expressed. They both provide a voice for those who have been marginalised, not only by development but also by science. The history of science gives ample testimony of its cultural biases and social idiosyncrasies but its self-perception as a value-free endeavour is strangely persistent. A closer examination of women's relationships to the environment and the gender issue in traditional cosmologies may well reap benefits for the epistemology of science itself.

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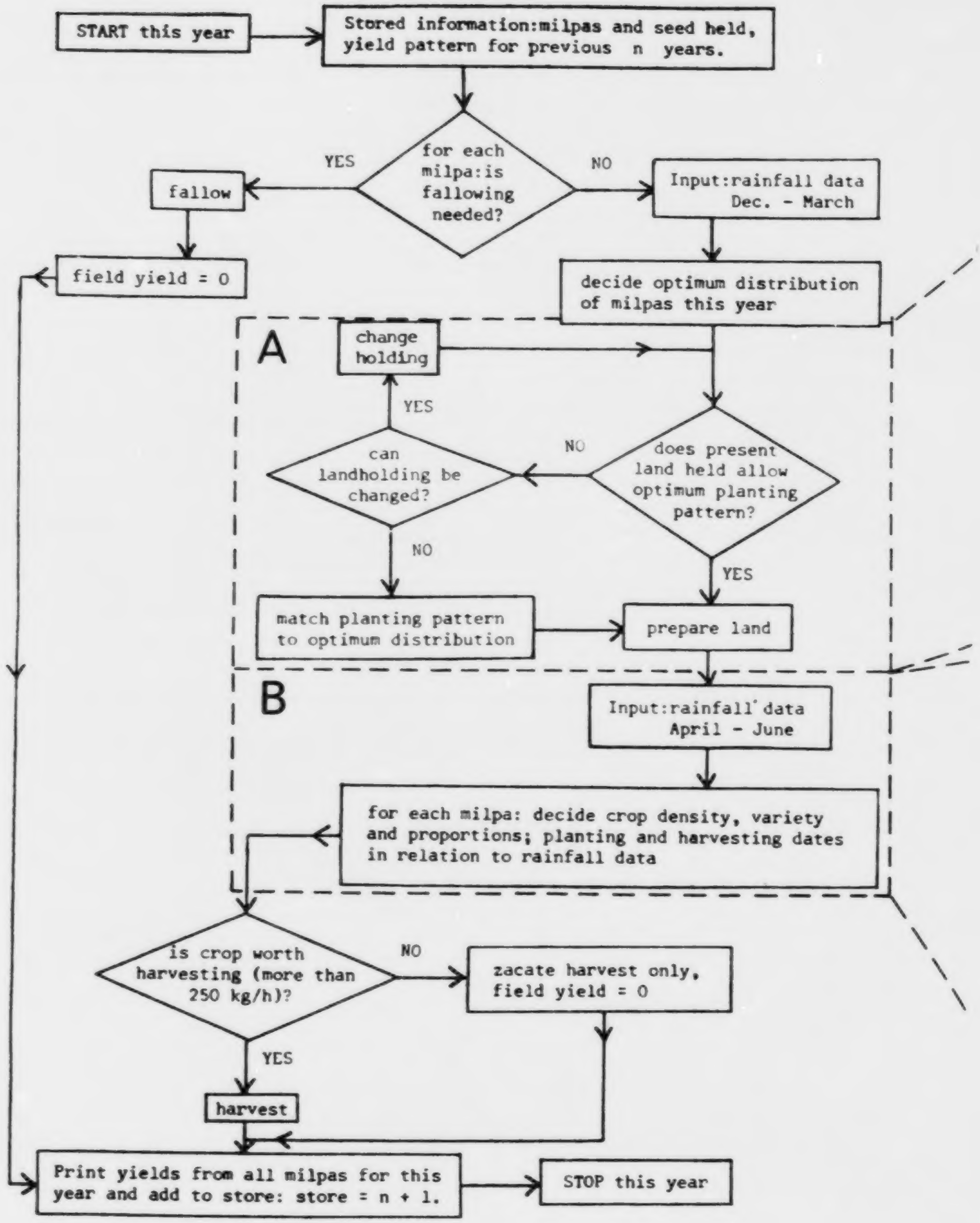
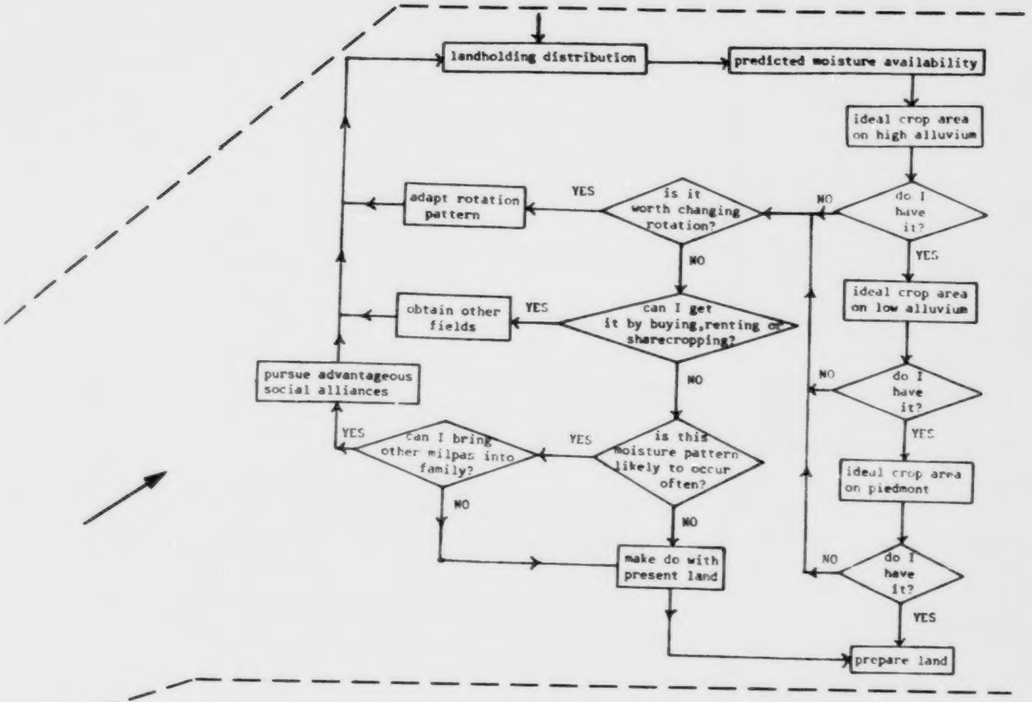
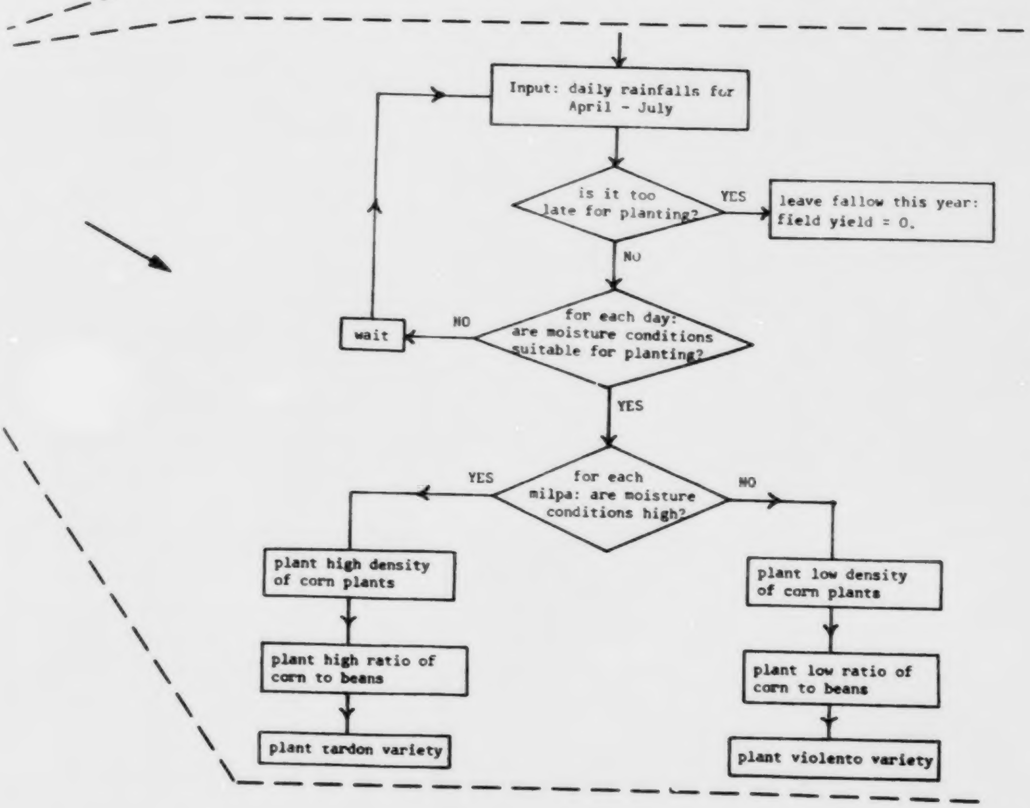

START this year
Stored information:milpas and seed held, yield pattern for previous n years.
for each milpa:is fallowing needed?
YES
fallow
field yield = 0
NO
Input:rainfall data Dec. - March
decide optimum distribution of milpas this year
A
change holding
YES
can landholding be changed?
NO
does present land held allow optimum planting pattern?
NO
match planting pattern to optimum distribution
YES
prepare land
B
Input:rainfall data April - June
for each milpa: decide crop density, variety and proportions; planting and harvesting dates in relation to rainfall data
is crop worth harvesting (more than 250 kg/h)?
NO
zacate harvest only, field yield = 0
YES
harvest
Print yields from all milpas for this year and add to store: store = n + 1.
STOP this year

Figure 1. Schematic flow chart for peasant decision-making about subsistence agriculture in Mexico (from Kirkby, 1973).


landholding distribution
predicted moisture availability
ideal crop area on high alluvium
do I have it?
NO
YES
ideal crop area on low alluvium
do I have it?
NO
YES
ideal crop area on piedmont
do I have it?
NO
YES
prepare land
is it worth changing rotation?
YES
adapt rotation pattern
NO
can I get it by buying, renting or sharecropping?
YES
obtain other fields
NO
is this moisture pattern likely to occur often?
YES
can I bring other milpas into family?
YES
pursue advantageous social alliances
NO
NO
make do with present land


Input: daily rainfalls for April - July
is it too late for planting?
YES
leave fallow this year: field yield = 0.
NO
for each day: are moisture conditions suitable for planting?
NO
wait
YES
for each milpa: are moisture conditions high?
YES
plant high density of corn plants
plant high ratio of corn to beans
plant tardon variety
NO
plant low density of corn plants
plant low ratio of corn to beans
plant violento variety

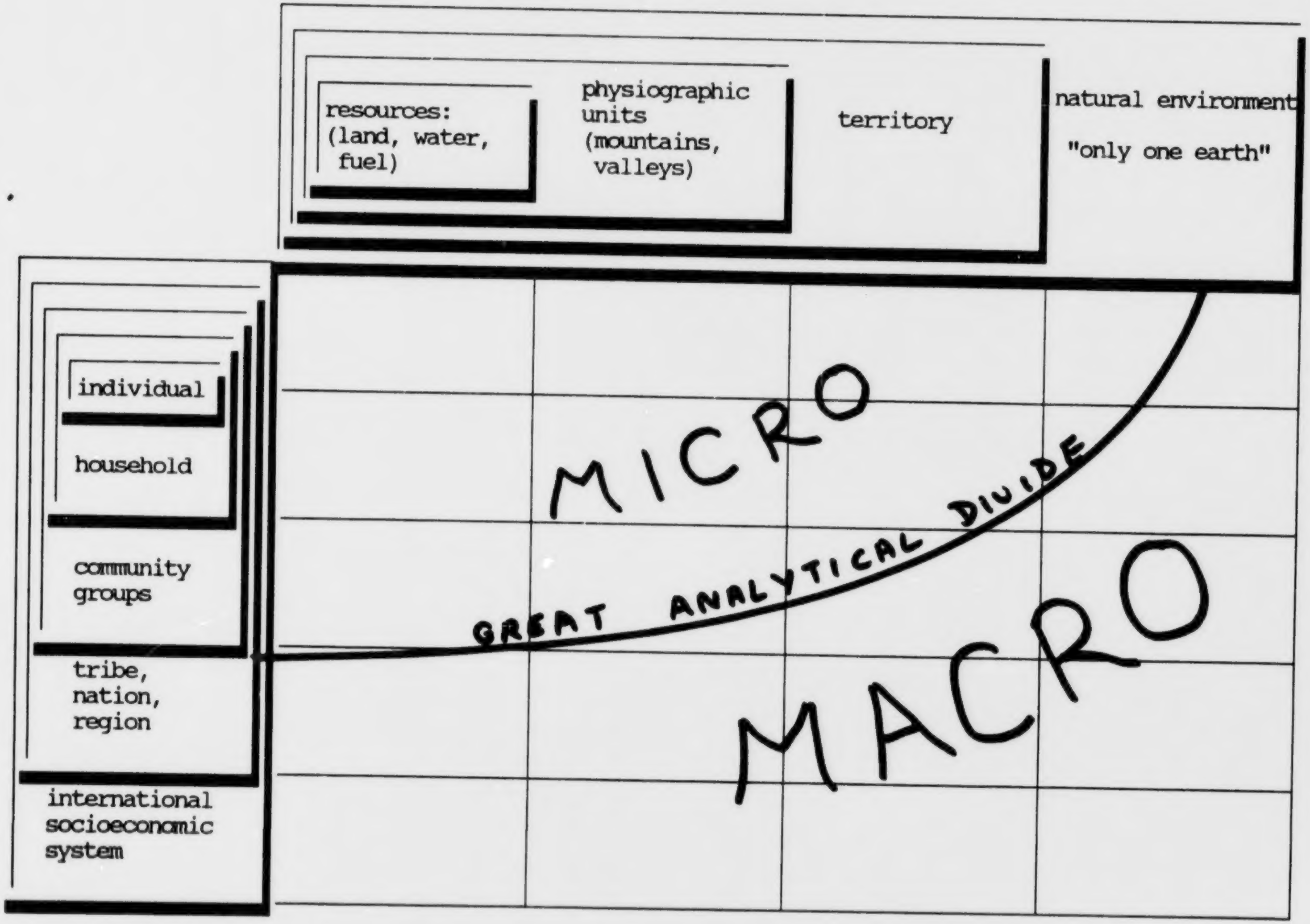

resources: (land, water, fuel)
physiographic units (mountains, valleys)
territory
natural environment
"only one earth"
individual
household
community groups
tribe, nation, region
international socioeconomic system
MICRO
GREAT ANALYTICAL DIVIDE
MACRO

Figure 2. The research conundrum; nested hierarchies and the analytical divide

A NOTE ON MULTIDISCIPLINARY APPROACHES TO DEVELOPMENT RESEARCH

Eva M. Rathgeber

A significant characteristic of most research on development issues has been the tendency for natural and social scientists to work independently of one another. Successful collaboration of natural and social scientists on jointly identified problems is relatively rare although farming systems research is one of the few areas in which this has occurred with some frequency (Horton 1984; Jones and Wallace 1986). The farming systems approach, which utilizes research teams composed of agricultural and social scientists, has been implemented successfully in parts of Latin America and Asia, although it is less well-known in Africa. It offers ample evidence of the potential benefits of joint research, but it has not achieved universal acceptance from discipline-bound researchers in development. For natural and social scientists to work together effectively, they must have a shared awareness of the strengths and weaknesses, biases and assumptions of their different disciplines. This paper examines the differing cultures of research in natural and social science and discusses an example of an IDRC-supported multidisciplinary research network in science and technology. It concludes with some suggestions as to how collaborative research between natural and social scientists might be incorporated into a network on women and natural resource management.

The Culture of Science

The disciplinary structure of the university, which is replicated in government departments and in private sector research units, has led to and perpetuated an increasing specialization and fragmentation of knowledge. Today it is difficult for an individual scientist to hold expertise in the broad sense that may have been possible one or two generations ago. Even within the realm of the basic or natural sciences there tends to be very little exposure to other disciplines. The scientist trained as a botanist or physicist usually has had exposure to other science subjects during undergraduate training, but with increased specialization the level of interaction with other disciplines commonly is reduced (Strong and McPherson 1982). Nonetheless, it should be noted that at the frontiers of science, cross-disciplinary research is beginning to re-emerge, so that, for example, some of the most radical new work being done in genetics is by biophysicists.

In the social sciences, intellectual fragmentation may have been a little less marked. In identifying differences between natural and social sciences, Strong and McPherson (1982) note that social science has "multiple paradigms" and that there is no universal acceptance of a particular theoretical framework at any given time. Social scientists work within frameworks that are often at direct variance but each with equal claim to validity. Strong and McPherson see a lack of clear boundaries among social sciences disciplines with the result that it becomes difficult to set agreed-upon standards for journals and for theory-building within disciplines. While this view of the social sciences may be overly skeptical, it is true that political scientists, educationists, anthropologists and others commonly utilize similar theoretical constructs. For example, many work within a framework they broadly refer to as "political economy." The precise definition of "political economy" varies from discipline to discipline, but at the most fundamental level it constitutes the examination of problems within the context of prevailing political and economic structures.

Strong and McPherson argue further, that social scientists are placed in a particularly vulnerable position because of the propensity of laypersons to take an active interest in the subject matter of their disciplines. Thus they are liable to be criticized or contradicted by persons outside their own field. They do not have the sense of exclusive control over knowledge which is usually held by natural scientists. This may be a compelling reason for the utilization of jargon within the social sciences, in order to create clear distinctions between the observations of laypersons and those of specialists.

Scientists and social scientists often demonstrate a significant lack of intellectual esteem across disciplines. Specialists schooled within a discipline tend to think that those who share their own training are best able to identify the most significant components of a problem and to make the most important contributions. This narrowness of vision has reinforced the reluctance of researchers in development to utilize multidisciplinary approaches. Neither natural nor social scientists are encouraged to look further than their own disciplines or their own group of disciplines in doctoral training. Thus a student political scientist may learn some economics or sociology but s/he is less likely to be exposed to philosophy (with the exception of political philosophy) or physics. The explosion of knowledge in a multitude of fields during the past few decades has made a multifaceted approach to doctoral training impractical but this does not explain why there has tended also a develop a sense of turf protection with respect to knowledge, i.e. strongly-held beliefs that other disciplines or groups of disciplines have less to offer to the solution of identified problems. This fragmentation of knowledge and the protectionist attitude which characterizes research in the North, has been replicated in the South. As a consequence, African scientists and social scientists rarely work collaboratively and the concept of "development" has been neatly subdivided into a multitude of separate problem areas.

Little is known about the backgrounds, attitudes and ideologies of natural and applied scientists in Africa. While it can probably be assumed that many originate from rural backgrounds, there have been no studies of their working relationships, their attitudes towards other scientists and the insights of other disciplines, their attitude towards research and application, etc. While it is likely that African scientists differ markedly from American scientists, it may be useful to review some of the findings that have emerged from studies of American scientists.

In general, American agricultural scientists tend to be conservative and to originate from farm backgrounds (Hadwiger 1982). Women are significantly underrepresented. A study in the late 1970s of 2,000 agricultural researchers in universities and government institutions revealed that only 4 percent were female and these tended to be concentrated in home economics and nutrition (Busch and Lacy 1983). This lack of recognition has meant that there has been little encouragement for the organization of research and ideas in agriculture in such a way as to take into account women's experience or perspective. In fact, until very recently, there has been no consideration that women's perspectives may differ from those of males. Not surprisingly, this gender bias has been transferred from the North to the South, embedded in agricultural education models.

Problem identification varies quite markedly in the natural and social sciences. In the former, except at the most advanced levels of research, problems usually are identified in response to user needs. Agricultural scientists often work on problems that have been identified by agro-industry or government. Medical scientists spend much of their time seeking cures to already- identified diseases. In the social sciences, researchers usually work on issues which they find of personal interest and/or which they consider to be of social significance.

In the natural sciences, there is strong emphasis on group solidarity. Researchers feel a sense of identification with and pride in prestigious work carried out by their colleagues. This is less common among social scientists, who focus primarily on their own work. The natural sciences are marked by a hierarchical system of movement through the ranks (Yirga, Seltzer and Ellis 1987). Young researchers usually join ongoing research projects rather than establish their own. In the social sciences, team research is less common and young researchers, after they have completed their doctoral training, are not likely to become participants in ongoing projects. Similarly, the norm is for individual rather than joint publication. Despite the emphasis on team research in the natural and physical sciences, however, most journals prefer to publish work which has been carried out within a single discipline (Hadwiger 1982). Inter- or multidisciplinary work is discouraged. It is valued less highly and often turned down by refereed journals because it is not considered to be a contribution to the field. In contrast, in the social sciences, despite the tendency towards individual work, there is a growing recognition of the importance of interdisciplinary work, particularly within the broad paradigm of development studies. This acknowledgement has led to the founding of numerous multidisciplinary journals which accept contributions from a broad range of social scientists. It should be noted however, that this openness to interdisciplinary work rarely extends beyond the social sciences to include the humanities or the natural science.

Natural scientists often are reluctant to introduce unfamiliar perspectives into their work, fearing that their colleagues will not understand or approve. Although individual scientists may recognize the benefits of bringing economic analysis into crop science research for example, their peers and/or the leaders in the field will not necessarily regard this as an appropriate methodological approach. Since the leaders in the field of crop science have achieved success through working within a single discipline, it is not surprising that many may react with skepticism or even derision to the introduction of so-called "soft" sciences. Perhaps because of this problem, social scientists often are brought into agricultural research projects at the final stages, i.e. at evaluation. In such situations, social scientists see it as their job to criticize and to point out to agricultural scientists how and why they erred. Agricultural scientists, for their part, argue that social scientists criticize their work but rarely learn even the rudiments of the scientific principles involved. Thus their criticism is based on lack of understanding.

These differing modes of behaviour, expectations and reward patterns among social and natural scientists, make it difficult for them to work together on common problems. With careful attention to research design and implementation however, it is possible to create networks and linkages between them. To illustrate, it may be useful to examine in some detail a network in science and technology policy established in Africa in the early 1980s.

Collaboration Across Disciplines: An African Example

Throughout the 1970s, IDRC supported substantial research on science and technology policy in the Andean Pact countries of Latin America. The Science Technology Policy Instrument (STPI) modules published in the late 1970s remain useful source documents more than a decade later. For a variety of reasons, however, it proved to be impossible to develop comparable research bases in Africa. To counteract this problem, a series of research training workshops were held in different regions of Africa. In each case approximately 24 participants, were brought together for a period of one month of intensive seminars on the nature of research in science and technology policy; appropriate methodologies for doing science and technology policy research; and key science and technology policy research issues in the region and in Africa as a whole.

One of the objectives of the workshops was to bring together three quite distinct sets of participants: from government, from universities and from public sector research institutions. They included economists, engineers, chemists, physicists, historians, lawyers and sociologists. Within one month they had to learn a common intellectual language and to identify problems of interest and importance to all of them.

To facilitate and encourage the development of research on science and technology policy, two regional research networks were established. The focus of the networks was on **policy research** rather than on science and technology research **per se**, placing a considerable burden on scientists and engineers who were forced to conceptualize problems from a new perspective. The social scientists, for their part, were faced with the challenge of collaborating with scientists who had developed the technologies which they had often criticized.

Network members, who included a core group of workshop participants and others interested in science and technology policy research, outlined research agendas and embarked on policy research. Differences in approach soon became apparent. For example, the social scientists saw a research report as an analytical and essentially critical document; for the natural scientists it was a description of a process of discovery. While the multidisciplinary approach was enthusiastically adopted by network members, it sometimes proved difficult to implement it in the context of home institutions which organized research along more traditional disciplinary lines. They were sometimes marginalized and had little collegial feedback in their own institutions.

These problems were recognized by the network and attempts were made to find solutions. First, the networks consistently emphasized that important contributions were to be drawn from every discipline. Second, researchers were encouraged to form interdisciplinary teams which could include, for example, engineers, sociologists, physicists and economists. Each member had discrete responsibilities and understood the precise nature of his or her contribution to the overall research activity. Third, frequent meetings of researchers were arranged. Each network met annually and provision was made for cross-fertilization, i.e. West Africans came to the East African meeting and vice versa. Over the years, researchers became familiar with one another and looked forward to continuing discussions which had started the previous year. Meeting participants reported on completed and ongoing research or they presented proposals for research they planned to undertake. The emphasis always was on group interaction, including discussion and feedback, rather than on a pedantic presentation of papers.

A fourth strategy involved frequent monitoring visits from IDRC staff. This proved to be important not only as a means of providing comments on ongoing research but also for circulating news of progress of other network members. Finally, national science and technology committees were established in each country. The committees were informal associations of natural and social scientists who met to discuss papers that had been written by members of the group or to examine research proposals that were to be submitted to the network for funding. In this way the researchers became involved in the process of evaluating research proposals, which in turn helped them to strengthen their own work, particularly with respect to methodological approaches.

Towards Multidisciplinarity in Research on Gender and Natural Resource Management

It has been shown quite clearly that multidisciplinary research involving both natural and social scientists is difficult for reasons having to do with differing patterns of expectations, peer interaction, and reward systems. Nonetheless, with careful planning and implementation it is possible to structure research initiatives in such a way so as to utilize the expertise of both sets of scientists. A necessary first step is the recognition that the process of "development" has created a set of problems which go far beyond the explanatory power of any single discipline.

There is no question that the examination of women's role in natural resource management calls for new research strategies. As has been pointed out by other contributors to this volume, little information exists about the nature of women's participation in natural resource management. It is known that African women are key users of fuelwood, that they have responsibility for grazing small animals and for collection of water, that they undertake subsistence farming and that they are active in milk production. It cannot be doubted that over centuries of participation in these and other economic activities, women have developed vast stores of knowledge and information which they share formally and informally with one another, passing it down from generation to generation. Much of their information and knowledge presumably has been attained through processes of trial and error. As such, it can be seen as having a scientific basis.

Surprisingly little is known, however, about the nature of African women's knowledge systems and the ways in which they share information. It is at this juncture that there exists a need for further research on African women's role in natural resource management. There is a necessity, first, to gather basic data about the knowledge bases African women bring to their interaction with the environment and then to develop strategies for ensuring that this knowledge is represented in the policy instruments developed by African governments. If this is to be done effectively, botanists, biologists, chemists, engineers and other natural and applied scientists must join with sociologists, economists and political scientists first to develop an information base about women's knowledge and then to translate that knowledge into language which will be palatable to and usable by African policymakers.

This is a new area of research which calls for new modes of interaction. The emphasis must be on the recognition of knowledge bases at the grassroots level and this will occur only if natural and social scientists work together to identify and legitimize that knowledge. If they are to succeed with this initiative, both groups of scientists will have to put aside their traditional theoretical structures and methodological biases. They must be willing, first to accord value to knowledge at the grassroots level and second, to organize that knowledge into paradigms which will enable it to be effectively utilized by national and international policymakers. It is a challenge that goes far beyond the ordinary but one which must be met if African women's understanding of their own situation is to be given the value which it deserves.

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APPENDICES

EXCERPTS FROM THE DISCUSSIONS HELD AT THE IDRC PROJECT DEVELOPMENT MEETING ON WOMEN AND NATURAL RESOURCE MANAGEMENT IN AFRICA
YORK UNIVERSITY, MAY 1988

Compiled by Patricia Stamp

The following excerpts, transcribed from the taped proceedings, reflect the thematic and substantive concerns raised by participants at the meeting. They range from insights regarding women's knowledge and its invisibility, to narratives vividly describing women's present day problems managing natural resources, to the difficult issues surrounding women's relation to the state and to international economic structures. The discussion took place over three days, following each formal paper and in several sessions devoted entirely to them. To sustain the flow of meaning, the transcript excerpts have not been divided according to the session in which they were presented; as well, they have been edited without the use of the conventional punctuation marks to indicate altered or omitted text (square brackets and ellipses). Please consult the list of participants in this document for details regarding each speaker's area of expertise and institutional affiliation.

...On women's knowledge about natural resource management, and the constraints they face -- from state, economy, society -- in acting on that knowledge:

BONNIE KETTEL: Our discussion shows that there is an overall theme and concern here, and that is women as producers of knowledge. It is worth bringing out more clearly the political dimensions of environmental degradation. It has been mentioned that resource perceptions vary between classes. Those who are poor often place the greatest stress on the environment, and there are political connotations to that. Then again, degradation of the environment has differential impacts on men and women, and on poor and less poor. Further, women as mothers, as grandmothers, as wives, and as daughters surely do not have the same type of relationship to the environment.

TAKYIWAA MANUH: Women are concerned about the longer term effects of resource management activities on the environment, but in many African situations you find they cannot act on that concern because of the constraints within which they have to operate. For example, the question of time allocation: when they have to go and fetch firewood and cut some trees, they may be indiscriminate because there is not enough time. The government and development agencies will come and look at their actions, and say that women are less concerned about the longer term effects of their activities on the environment. The development programmes that are introduced in those areas take the position that they are dealing with people not concerned with their effect on the environment. But it is not women's strategy to cut down all the fuelwood near by; they really have no options very often. How would you go about straightening this out?

How should we approach the problem in our research? We need to do much more research with women to find out what women's views really are, to show that they are constrained in their actions. We must use the political route as well as the research route to let the women's voice be heard more clearly. This brings us back to the question of women as producers of knowledge. There was a very good paper done by an Iranian scholar, who showed that people -- particularly the women -- understood very clearly what the end result would be when the first boreholes came in. They said that people would concentrate around them because they would want to take their animals there, and that it would end in desertification. Although it took some years for the development experts to realize that, she has very good evidence that it was known immediately to the local people. They need not have suffered that experience at all. So how do we enable those voices to be heard at the beginning?

FEKERTE HAILE: I was reading a collection of papers on agroforestry schemes. One of them reported on the government's decision to clear a piece of land that it considered wasteland. But this land had multiple functions for the women there. The administrative scheme's treatment of the area as wasteland had very negative consequences for the women involved. The men also had several uses for the land, but it was the women's approach that was the more inclusive. The study showed very clearly how women conceived of the environment. The example makes the case for both a long term perspective and a multi-functional perspective on the environment. But even if women know the long term effects of what they are doing, as long as they don't have alternatives they will continue negative practices. Let us take the forest: there are all kinds of tools being developed now, and we have yet to find out whether they are more efficient and cheaper than the tools currently being used. So I think we should address ourselves as well to providing the alternatives.

JANE PARPART: I think this is getting us on to a fascinating terrain, and is pulling us back into big questions. The discussion raises two: what is the work that women are doing, relevant to natural resources? and what is the knowledge that women produce regarding natural resources? There is another larger question that I would like to raise in relation to these two, and it is a question applicable not just in Africa, but here and everywhere. Why are women's work and women's knowledge either made invisible or, if known, underestimated and discounted? How do the structures of society create knowledge patterns and authority patterns that undercut and undervalue women's work and women's knowledge? I think we have to start looking at the role of the state. I use 'the state' in the broadest of terms here, to include all the apparatuses that are used by the government or the regime to buttress an entire social structure. For that, we must look at the media and the schools and all of the major institutions that keep a society going. They perpetrate a view that the way the society runs is the way it always has run and the way it always should run, and that the people who now run it, namely men, are there because they are smarter, they know more. Men's knowledge is somehow valued more than women's knowledge, and that is why when women come with very wise statements about what is going to happen if you do X, development planners from this end of the world and development planners in the Third World just put it aside. I think that some of this is because many parts of the state structure -- the media and the schools in particular -- are arenas where male knowledge and male experience tend to be legitimated and publicized. This raises the very interesting subject of the construction of knowledge, and there is some fascinating feminist work dealing with it, called "standpoint feminism". This approach says that all of the models we are discussing are male models, which tend to come out of the male experience in the most fundamental daily kind of way -- even to what body is a normal body. This group of feminists is saying that we as women have to go back to ourselves and start to construct a female explanation of how we experience work and daily lives, and then we must work out how to assert the validity of that experience. Then we must put it into the power structure, to begin to alter some of the conceptions of what is natural and normal. This line of thought thus takes us from the biggest realm down to the littlest. What is it in male experience that has shaped this dominant knowledge which subordinates women's knowledge?

PATRICIA STAMP: This is precisely where discourse theory comes in. With this theory, you can move away from looking at the individual male, and the individual male experience, to the way in which male-dominated aspects of society have been reorganized in the last couple of hundred years. This is where we do "genealogies" -- histories of ideas about all different aspects of society -- for example a "genealogy" of sexuality, or a study of the ideas that came about with capitalism in the liberal state over the last two hundred years. This approach doesn't get stuck the way radical feminism does on 'men and male experience' versus 'women and female experience', at the level of the individual. It provides a historical context for thinking about male-dominated knowledge.

BRIDGET UBOCHI: Looking at the role of the state, and thinking about history, brings us back to what Bonnie said earlier about the political dimension of development. European history is revealing, in the way in which the state aided and abetted industrialization, the disruption of the family system and the imposition of male-dominated knowledge in Western society. Colonialism undermined traditional systems in non-Western societies in a similar way. In a paper I read by Shimwaayi Muntemba, she reported talking to Zambian peasants, who asked, why do you always talk about women? For us the opposition is not so much between male and female peasants as between peasants and the state. A good approach in our research is important: perhaps the people we are going to talk to do not see the problem primarily as a question of female versus male knowledge. I am trying to suggest that the same domination with great loss has occurred in Western traditional knowledge. Also, there are parallels between traditional knowledge systems in Africa and other developing countries.

...On women, production and natural resources

FATOU SOW: What does the role of women as food producers have to do with food strategy, and with the food crisis on the continent? These are questions that have not been clearly identified in the literature.

Decisions are being made at a macro-level: pricing incentives and other policies are directed towards the progressive farmer and cash cropping. I have several examples that demonstrate the need to think about women's access to natural resources. One observation I made during fieldwork, was women's problems repairing their houses. I was looking at the poorer households in one region, and found that their thatched roofs were very dilapidated: the particular grass they use to thatch with is no longer easily available. If it is to be found, it is extremely expensive -- it is even more expensive to thatch some huts than to put on a corrugated iron sheet. So you find houses where the roof is leaking because women cannot afford to patch it, and because they can't raise enough money to buy the corrugated iron. This relates to the earlier point about women not being able to act strategically in their own interest. Another example is about fishing villages. Some coastal villages in Senegal began to experience problems with tourism challenging the fishing activities. The Southern part of Dakar is one of the most productive fishing areas of the world: fishermen come from Japan, Europe, Canada and the United States to fish with electronic equipment. The local fishermen are convinced to leave certain beaches to the tourists, who also come from all over the world. I participated in a research project I did with an aid agency, which aimed to improve fish production in Senegal. The project proposed to move the fishermen's harbour from Dakar city, to make room for hotel development. If you move the fishing activities to another site, men may have no problem, but women, who process and smoke the fish, suffer. They are asked to travel 10 or 20 miles away from their homes, rather than the one mile's walk to the old harbour. This project demonstrates the undermining of the productive use of the environment in order to preserve the environment for another purpose. It reveals a conflict between state policy and communities' production needs. A further example relating to fishing is the question of damming rivers. Feasibility studies indicated that proposed dams would actually improve fishing resources, but the predictions proved wrong. Fishermen could not use their normal craft and equipment because of underwater snags in the dam, that were not properly cleared. Their nets were torn, and fishing activities decreased. Future research should look at the implications of some of these developments, such as damming rivers and putting up huge hydroelectric schemes.

RUVIMBO CHIMEDZA: In Zimbabwe, on the Zambezi River, they built a huge dam and then realized they had to move people. The displaced people were resettled in the Zambezi Valley without any careful planning. The Zambezi valley has a lot of problems, one of which is the tsetse fly. It is the most disadvantaged region in the country. The planners decided the area needs a lot of attention. The tsetse fly problem has to be tackled for people to be able to live there and for wild life to continue to flourish. The European Community has come in with the money for a project called Camp Fire to get rid of tsetse flies: it does so by setting huge tracts of land on fire. For the people affected, this does not make sense because the fires destroy a lot of wild life, plant life, and the systems people are used to. The valley is not a very good agricultural area, so people have been more dependent on wild plant and animal life than in other areas. The project left this out of account, even though it was supposed to help people. It really does affect them negatively in the short term, though we do not know about long term benefits yet because the project is still on-going. It means, however, that the people there have to start developing new coping systems. The project has included some income-generating schemes, and is managing wild life activities with the aim of direct benefits to people. But these do not contribute to food security directly. When a community gets revenue from wild life activities, normally they are reinvested in community development projects. The benefits are not redistributed to individual households. The food security situation cannot be improved instantly by the building of a new clinic, even though this is of course needed, or by constructing roads (two common development uses for the money). People thus have much more to cope with than simply resettlement, and this makes their lives very difficult.

EVA RATHGEBER: Takyiwaa has just started a project which relates to some of these issues that you have been mentioning. Maybe she would like to describe it, because I think it will give people an idea of how you can move from thinking about these issues to actually designing research projects.

TAKYIWAA MANUH: All right. I will talk about two things because as I was listening to Ruvimbo talk about resettlement I was thinking about the Volta resettlement experience in my own country. In the 1960s the Volta Lake, which is the largest man-made lake in the world, was created in Ghana. I doubt that any of the manuscripts or research project which came out of that investigated the effect on women of the resettlement experience. So much land was flooded, and many people had to move. As a lawyer, I have seen that many court cases, where families did not get the compensation that lawyers had entered court claims for. Some lawyers got into trouble because they signed receipts for money which people never saw. In addition to the legal problems, there were environmental hazards. Many new diseases spread in the area. After listening to the discussion here, I plan to check whether anyone has tried to find out what the claims problem has meant for women.

Coming to my own project, my research is going to be on a group of women who live around the Lagon area in the South-eastern part of Ghana. I was hoping in my paper to find a way to talk about women's access to creeks and lagoons. Although I focus on land, I think a parallel issue is the loss of rights that many people, especially women, have experienced regarding access to lagoons and creeks. First of all, the creation of a fresh-water lake affected the flow of water into the lagoon, and the lagoon began to dry out. This was a lagoon which produced salts during the dry season, and which was used for fishing in the rainy season. It is situated in the Ada area; there is one particular clan who traditionally is said to own the lagoon. The lagoon is tied up in the whole culture, and in religious rites. There is a priest and priestess of the lagoon who traditionally controlled access for salt draining. In order not to degrade the environment, they would determine when the salt was growing, and then determine the time for harvesting. Until the ban was lifted by them, nobody could go into the lagoon to harvest. The priest and priestess would put sticks into various spots of the lagoon, and there would be a ceremony, after which people would be allowed to harvest the salt. Traditionally, people paid a token toll for harvesting. There is some historical documentation of the importance of the salt trade in Ghana: it was a trade that went back at least as far as the 18th century, and Ada salt was the most highly valued. The historical records also show how during colonialism the Ada salt trade survived colonial attempts to kill it by importing cheap salt. People preferred the Ada salt, however. Marketing and distribution strategies developed throughout Ghana. As a result, Ada people were fairly proposperous.

In the 1970s, however, local control was undermined. Leases of the lagoon were granted to two private companies, both largely Ghanaian. The effect of granting the leases to these companies was that the local people no longer had access to the lagoon. The part of the lagoon which was left to them was so far away from their villages, that it did not make sense to carry their digging equipment to harvest the salt. As well, the allocation ignored their religious and cultural beliefs, in that the part granted to them was the abode of the god of the lagoon. So they would not go there to harvest, for religious reasons. Finally, that part of the lagoon was a fresh water source, and they refused to harvest there in order not to upset the ecological balance. A real conflict developed in the area between the local inhabitants and the companies. The companies used the police and army to terrorize the local inhabitants. If the local people persisted and managed to win some salt they were arrested on the roads: if a woman was trying to send salt on a cart for sale, they would ask for receipts. This was part of the tactics used to undermine the local people.

Early in the 1980s some people decided to help the local people to form cooperative societies. About three years ago, matters came to a head when one of the companies constructed an embankment and dykes across the lagoon. These impeded access, and impeded the flow of water to certain parts of the lagoon. It also meant that religious and cultural festivals could not be carried out, because they could not sail right across the lagoon. Meanwhile, the other company was bankrupt, and simply asked the local people to go and harvest, offering to divide up the produce: it did not even make a pretense of production. The first company, which was strong, claimed in its Articles of Association that it was going to manufacture salt by the vacuum method, but in fact it used the same sun drying method as the local people. The brutalization of local people forced the state to step in, and a community inquiry was set up. This led to a confirmation of the company leases, and a requirement that people be allowed to go about their business. My study is to use life histories, to investigate what has happened to people there. I will focus on women, though some men will also be interviewed.

...On getting governments to deal with women's issues, and the wider economic realities of international austerity programmes

RUVIMBO CHIMEDZA: Before IDRC says anything about the problem of conflict between women's interests and state interests, and what agencies should do about it, I think we the Africans better put in a word. I don't know whether my colleagues from other countries have different views, but we are already trying in Zimbabwe to get women's issues into government, and it is very difficult -- especially for women at the grass roots level. I therefore wonder what external agencies are going to be able to do, because women are fighting even to be recognized on the political level. And in my country, what you often find is that the women who get to the top, and who are nationally recognized, receiving government posts, ministerial positions and so on, relax their efforts about women's issues at the grass roots. On the other side, policy makers on the top are not really interested in research reports. So how can we intervene in national policies? I will give an example. We had a problem of water pollution, through infestation by a foreign water weed. It has been said over and over again that some research should be done on this, but nobody is interested in research because results will only come in the long term. What everybody in government is talking about is clearing the weeds. And clearing is a very short term solution, because the weed is seasonal, spreading in the fresh water of the rainy season. All efforts are geared to clearing it, and then for the next three months we forget about it -- and then it comes back again next year. Yet they say research is too expensive. I think that when IDRC comes to fund a research project the way it is going to be interpreted is partly defined by who is actually carrying out the project. It is not going to be an IDRC officer who comes and does the work and has their name on the report. It will be me, maybe, through the university, or someone in the Ministry of Community Development and Women's Affairs -- or somebody in the Zimbabwe Institute for Development Studies. Now, these institutions are set up to do research objectively, and in most cases policy makers will not bother to look at their research results until the issues become pressing. Then they will ask what strings are attached to a project, and what IDRC is going to do with the results. If a research project conflicts in any way with what policy makers think, and my name is on the project, I might get into trouble myself, or the institution will get into trouble, if it appears it is threatening the power structures.

EVA RATHGEBER: Some Women in Development programmes place a rather heavy reliance on women's bureaus. Women's bureaus have been established in a number of countries, not only in Africa but also in the Caribbean, Latin America and Asia. But in most cases the women's bureaus have not been particularly effective in representing women's interests. They have not been taken very seriously by other ministries; they have often been underfunded; and they have often been staffed with people who do not have the technical expertise. So if women's bureaus are going to be effective, the idea must first be planted in the minds of policy makers that women's issues are important and that women have something to contribute to overall development strategies. I wonder whether it can work.

TAKYIWAA MANUH: In Ghana, a National Council on Women and Development was set up in 1975. This is an organization that is promoted by the government. It is hard to see the Council coming out with its own policy towards the structural adjustment imperatives being imposed by the International Monetary Fund. The Ghanaian government is cooperating with the IMF on adjustment, but this is creating a lot of difficulties and now the government has appealed to international donors. Within this context, the Council on Women and Development is doing whatever is assigned to it and is not taking any real initiatives. It is very difficult for an agency such as IDRC or CIDA not to be accused of interference if it questions the organization. If you are presented with a national council or a women's bureau to deal with, you cannot say, 'we will not deal with you because you are not very experienced'. I think that one of the ways in which women's bureaus could be strengthened would be to provide training programmes for some of the people in them, so that they would have the capacity to think of innovative projects that help women. Otherwise, you see the organizations taking whatever comes their way. For example, the United Nations Fund for Population Activities comes, and they are interested in women's fertility, so they offer money. So a project on this is set up, because the women's organization has very little capacity to design projects for themselves, or to determine for themselves the basic needs of poorer women. A lot of money is being given to these women's bureaus or commissions because they are the official bodies. But in terms of what they come up with, they do not help anybody at all: it involves throwing away good money.

EVA RATHGEBER: You have to ask the fundamental question, what is the role of the women's bureau? If a country has one, does that mean that anything having to do with women gets handled by the bureau, and the rest of the government is therefore to do with men?

STELLA LEIGH-WILLIAMS: As it is the government who appoints the people to the organizations, it would be difficult to say anything that contradicts what the government is standing for. If you wish to assess the impact of structural adjustment on women, then you are questioning it for everybody. If the government does not see its negative consequences, you are in trouble with your opinion: it looks as though you are standing against yourself. These are very sensitive issues. I believe that the facts could be presented in some other way. Let us say that there are research workers who have studied the effects of structural adjustment. Nothing would stop them from presenting their findings in a public forum. Let the press blow it up. Whether anybody will pay you attention or not is another matter, but at least the facts will have been made known.

Excerpts from the discussion following Fekerte Haile's presentation: "Women Fuelwood Carriers and the Supply of Household Energy in Addis Ababa

EVA RATHGEBER (CHAIR): The presentation has clearly shown the seriousness of the fuelwood problem. The presentation of the broad spectrum of concerns was very valuable, from the urban issues, to economic and health aspects, to questions regarding rural-urban migration. We should focus in our discussion on some of the socio-economic relations that were mentioned, and also on the conceptualization of forest resources. The multiple use of forests, the rural-urban link, and the question of devolution of control over forest resources are all matters we should consider.

MERLE BOWEN: Last year, when I was in Mozambique, I worked in an irrigation scheme and it was one of the few areas in the region where peasants could still grow food. On the fringes there were frequent attacks by the MNR bandits, and there was also a problem with drought. So you found that peasants who lived in these insecure areas could no longer produce on their farmland. They would fetch wood, however. Within the irrigation scheme, there were families who grew food but did not wander out to the insecure areas, and they struck up a trade agreement where the women from the insecure areas, bring firewood to the women inside, and exchange this for food, and that is how they survived. Is there anything like this barter trade in the Addis Ababa region? Are the women who deal in fuelwood passing the business on to their daughters? Did any of these women's families ever have land?

STATEMENT FROM THE AFRICAN PARTICIPANTS

In discussing the issue of women and management of natural resources in Africa, we think we should begin with the question "to what extent can African countries be said to control and/or manage natural resources on the continent" and "what is the role of International capital in the management of natural resources".

Related to the control of natural resources is the African economic crisis and the programme of adjustment worked out by IMF and now being implemented by most African countries. Typically, these Structural Adjustment Programmes aim to address the deficit in the balance of payment through:

1) increase in export, both traditional and non-traditional;
2) cuts in public expenditure;
3) reduction of the role of the state;
4) liberalization programmes to give greater play to market forces.

The impact of these policies on the countries and people is now being documented. They are known to have negative effects on the population especially women.

We believe that research questions should begin to address the precarious conditions of African women in relation to resources and Structural Adjustment Programme. In particular the impact of:

1) increased export of traditional and non-traditional primary products on:
    a) women's use rights in production resources
    b) household and national food security
    c) environmental degradation
    d) social relations of production and exchange at international, national, community and household levels.
2) cuts in government expenditure and health, nutritional status and educational levels.
3) liberalization programmes on local production and the informal sector.
4) removal of subsidies on food, agricultural inputs and energy.

In addition to the above condition SADCC countries have to cope with the problems of destabilization and dependence on South Africa.

What has been the response of African women to these precarious conditions?

Despite formidable constraint, African women have been developing environment. It is the task of African researchers to examine the processes outlined above and use the results to challenge existing theoretical frameworks.

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